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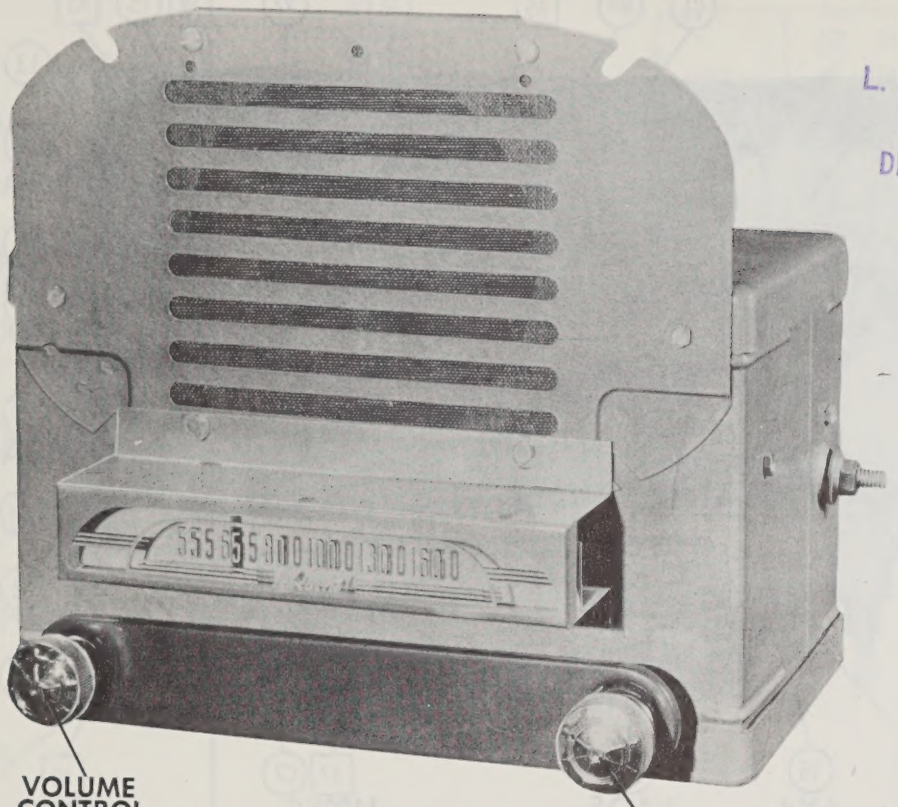
AIRCASTLE
MODEL 610.C351



AIRCASTLE
MODEL 610.C351

TRADE NAME	Aircastle Model 610.C351 (For 1951 Chevrolet Automobiles)
SUPPLIER	Spiegel Inc., 1061 W. 35th St., Chicago 9, Ill.
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier.
POWER SUPPLY	6 Volt Storage Battery — RATING 4.7 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	538-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn tuning gang fully open and set pointer to coincide with the "0" in "160". Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	100MMF	High side to antenna lead. Low side to chassis.	1600KC	"	"	A5	"
3.	"	"	1400KC	Tune for max. signal	"	A6, A7	"
4.	"	"	600KC	"	"	A8, A9 A10	Adjust for maximum output. Repeat step 3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		AIRCASTLE PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	20	350	CE-86	AFH3-107		▪UP2235C		TVL-3678	▪ Filter
B	20	350							▲ Filter
C	20	25							Audio Output Cathode
C2	.05	200	C207	P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C3	.05	200	C207	P288-05	DF-503	PJ2S5		2TM-S5	Screen Bypass
C4	.05	200	C207	P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C5	100		CC200	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	Osc. Grid Cap.
C6	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	Diode RF Filter †
C7	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling ¶
C8	220			SI220	D6-221	5W5T25	GP2K-251	5GA-T22	AF Amp.Grid Filter †
C9	220			SI220	D6-221	5W5T25	GP2K-251	5GA-T22	AF Amp. Plate Bypass †
C10	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C11	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C12	.008	1600	C205			PTE16D8		MB-D8	Buffer Cap.
C13	.5	100	C209	P185-5		MP2P5		68P20	Hash Filter
C14	.5	100	C209	P185-5		MP2P5		68P20	Hash Filter

† Some Models use 200MMF in this application (Part No. CC201)
¶ Some Models use 002MFD in this application (Part No. C203)

CONTROLS

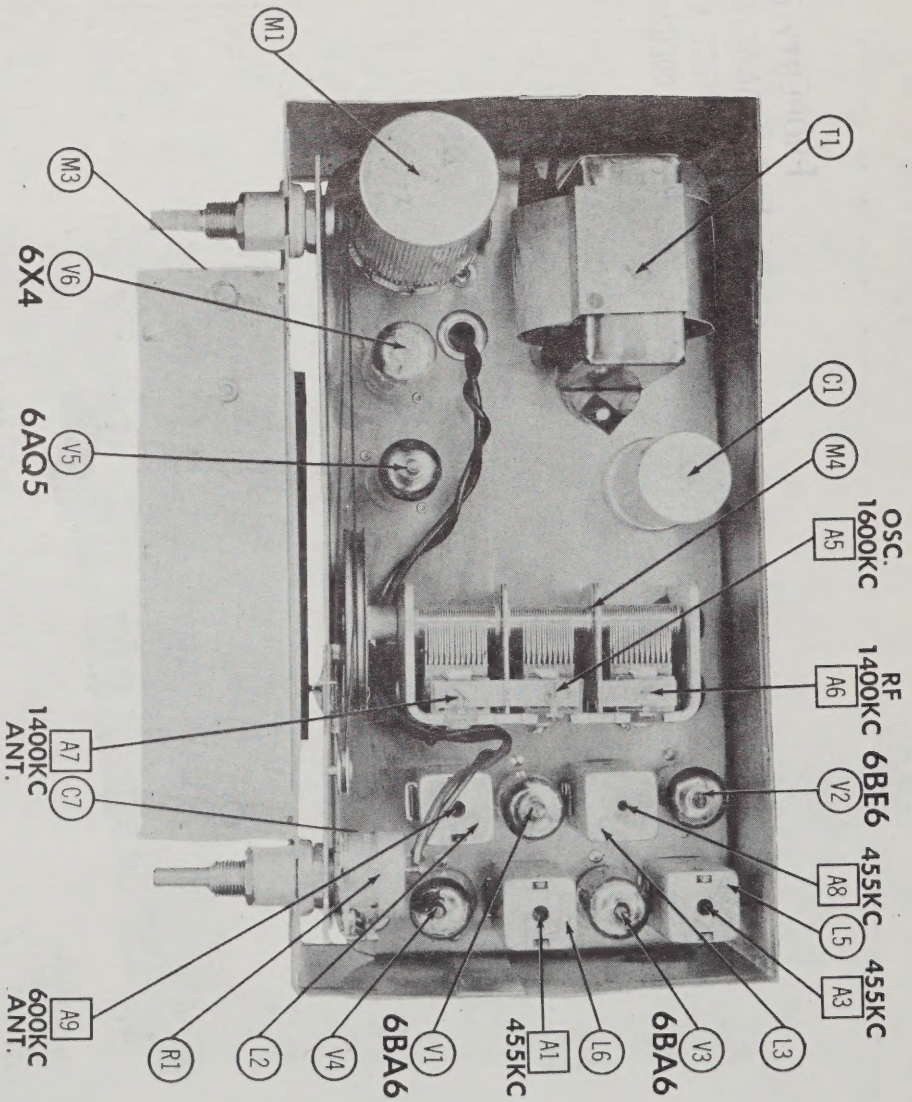
ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	
R1	750KΩ	½	RV-200			Volume Control & Switch

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	
R2	330Ω	½	R303	BTS-330	RF Amp. Cathode
R3	20KΩ	½	R306		Osc. Grid
R4	1.2Meg	½		BTS-1.2Meg	AVC Network - See Note 1
R5	1500Ω	½	R314	BTS-1500	IF Amp. Cathode
R6	20KΩ	2	R313		Screen Dropping'
R7	2Meg	½	R310		AVC Network
R8	8.2Meg	½		BTS-8.2Meg	AF Amp. Grid - See Note 2
R9	250KΩ	½	R307		AF Amp. Plate
R10	680KΩ	½		BTS-680K	Output Grid - See Note 3
R11	330Ω	½	R303	BTS-330	Output Cathode
R12	1000Ω	1	R312	BTA-1000	Filter
R13	68Ω	½			Hash Suppression - See Note 4
R14	68Ω	½			Hash Suppression - See Note 4

Note 1. Some Models use a 1Meg Resistor in this application
Note 2. Some Models use a 10 Meg Resistor in this application
Note 3. Some Models use a 500KΩ Resistor in this application
Note 4. Some Models use a 100Ω Resistor in this application

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3VDC @ 3A	430VCT @ .046 ADC			TV-100		P-2971	VT-1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	4.5KΩ	3.3Ω	335Ω	.5Ω	Part of PM-706	A-3877	A-2930	R0-8	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P.M.	3.3Ω	PM-705	Mod. P5-X ST-105	5A07	
	CONE DIA.	V. C. DIA.				
SP1A	5"	9/16"				

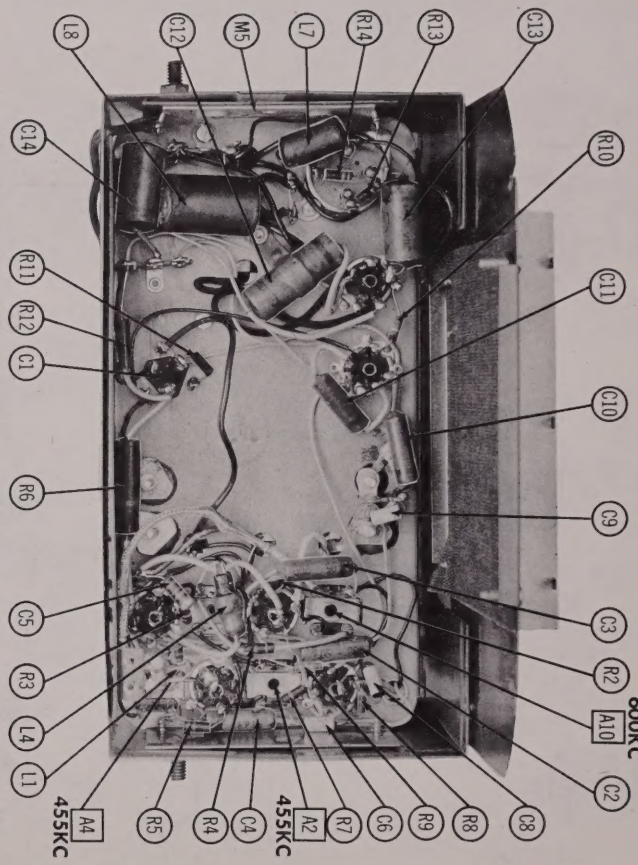
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AIRCASTLE PART No.	MERIT PART No.	
L1	Ant. Hash Choke	1.1Ω		L200		Wound on Capacitor
L2	Ant. Coil	14Ω	4.8Ω	57FB-3		
L3	RF Coil	100Ω	7.8Ω	57FB-4		
L4	Osc. Coil	8.5Ω		L201		Tap @ 7Ω
L5	Input IF	19Ω	19Ω	1655-16	BC-352	
L6	Output IF	19Ω	19Ω	1655-16	BC-353	
L7	Fil. Choke	.6Ω		L203		
L8	Hash Choke	0Ω		L202		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				AIRCASTLE PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Interrupter	6.3 VDC	115	V-94	5301	5301	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

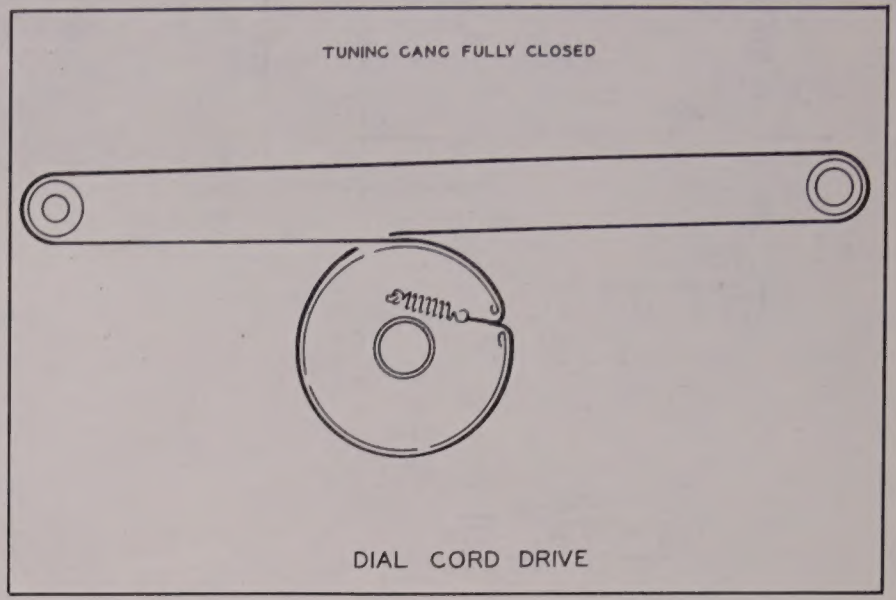
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRCASTLE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	15A. 32V.	A201	A351	311015	155020	AGC15	HDJ-B

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M3	Bayonet	7.5	.2	White	T51		Type #51

MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M4	3 Gang Var. Cap.	CV-200	(24-387MMF, 20-317MMF, 37-227MMF)
M5	Spark Plate		
	Dial Scale	D351	
	Pointer	PS351	



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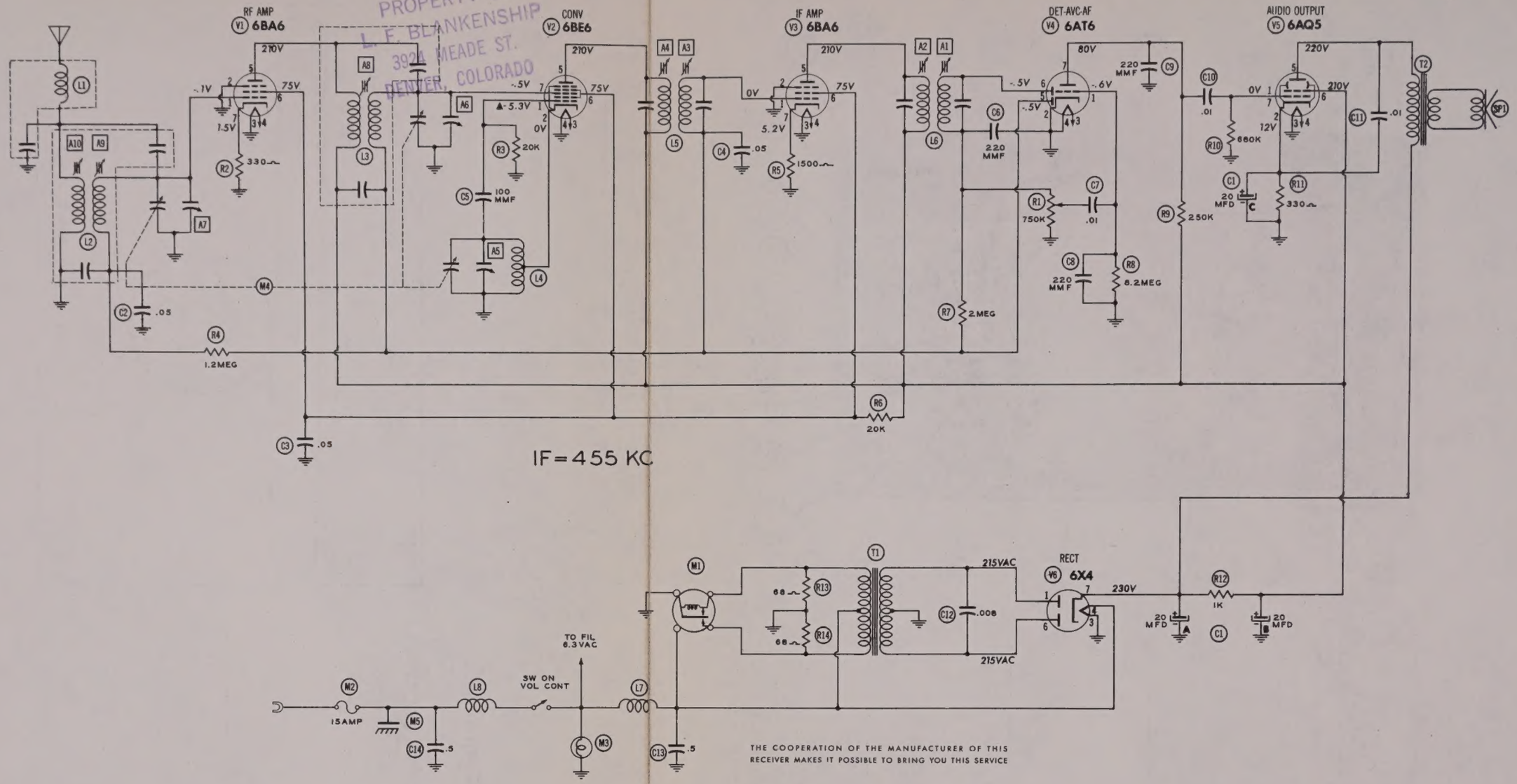

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	3.9Meg	0Ω	0Ω	.4Ω	†1KΩ	†21KΩ	330Ω
V 2	6BE6	20KΩ	.7Ω	.4Ω	0Ω	†1KΩ	†21KΩ	2.7Meg
V 3	6BA6	19Ω	0Ω	0Ω	.4Ω	†1KΩ	†21KΩ	1.5KΩ
V 4	6AT6	8.2Meg	0Ω	.4Ω	0Ω	2.7Meg	750KΩ	†250KΩ
V 5	6AQ5	680KΩ	330Ω	0Ω	.4Ω	†335Ω	†1KΩ	680KΩ
V 6	6X4	240Ω	INF	0Ω	.4Ω	INF	260Ω	40KΩ

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

† MEASURED FROM PIN 7 OF V6
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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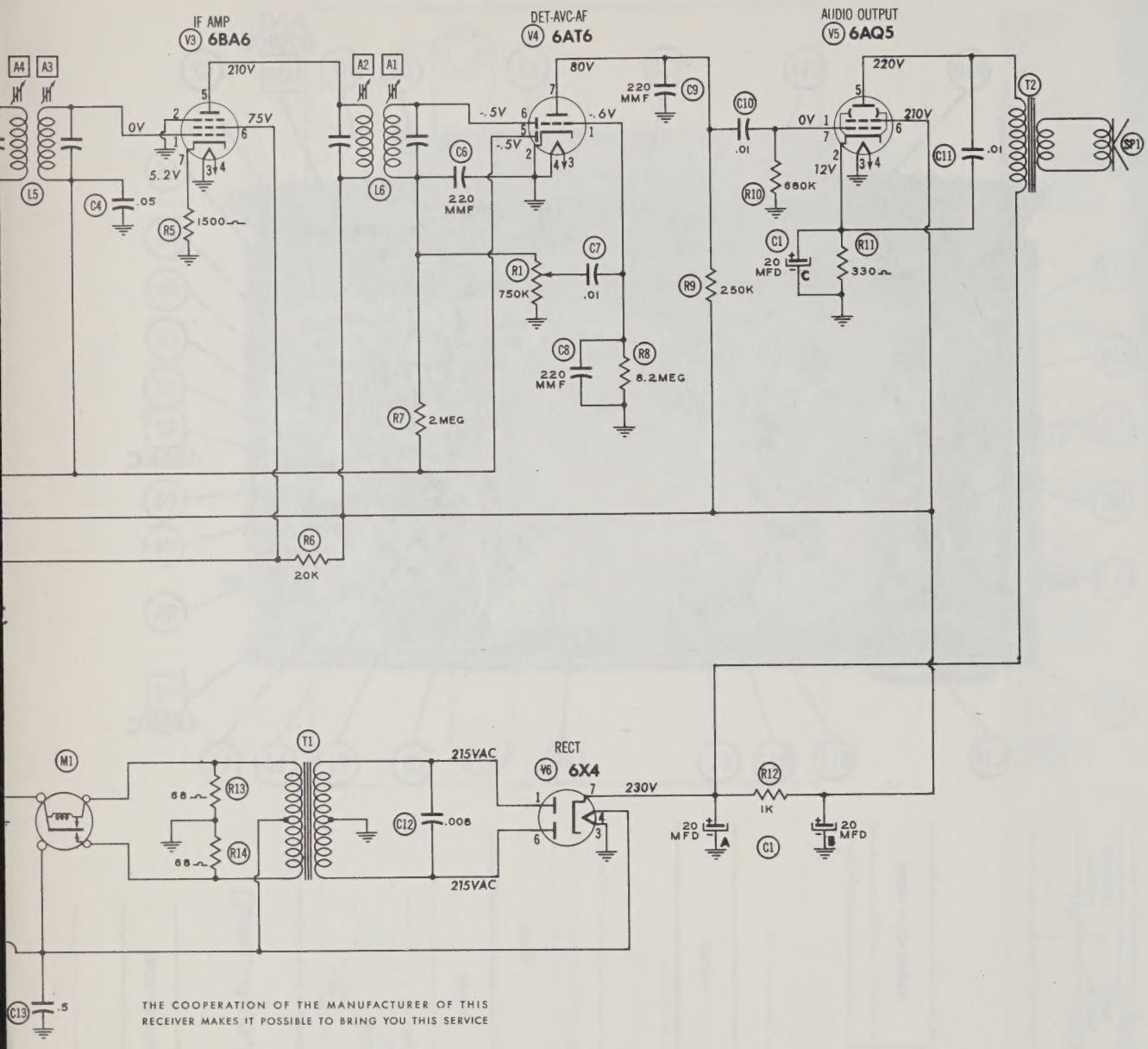


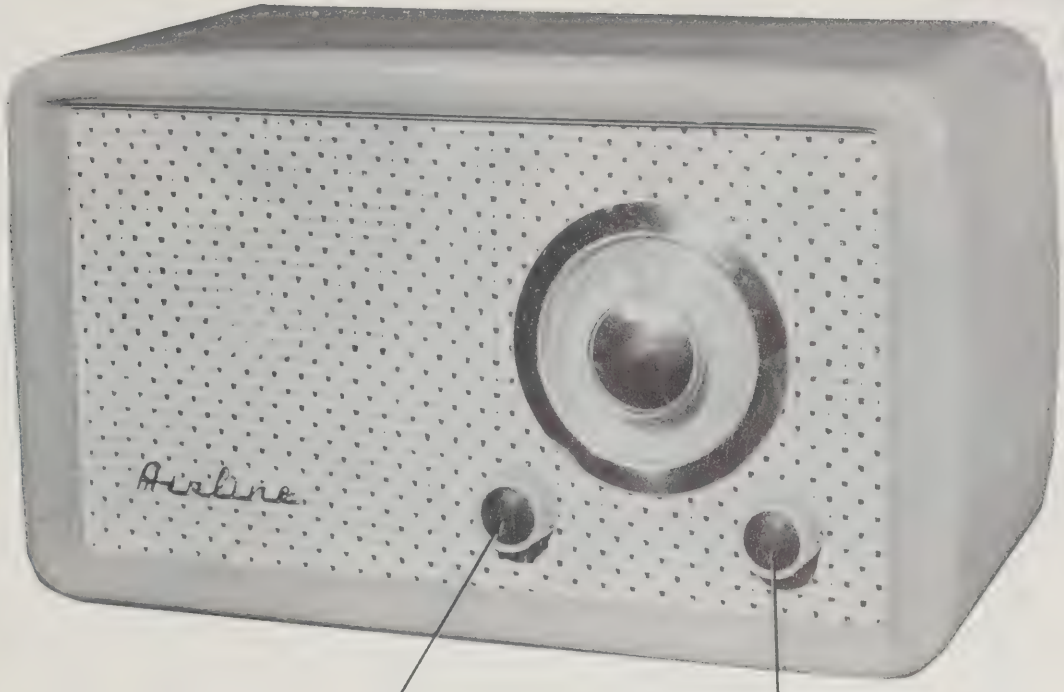
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
0Ω	0Ω	.4Ω	†1KΩ	†21KΩ	330Ω
.7Ω	.4Ω	0Ω	†1KΩ	†21KΩ	2.7Meg
0Ω	0Ω	.4Ω	†1KΩ	†21KΩ	1.5KΩ
0Ω	.4Ω	0Ω	2.7Meg	750KΩ	†250KΩ
330Ω	0Ω	.4Ω	†335Ω	†1KΩ	680KΩ
INF	0Ω	.4Ω	INF	260Ω	40KΩ

ASURED FROM PIN 7 OF V6
KEN WITH VACUUM TUBE VOLTMETER

AIRLINE
MODELS 25GSE-1555A, 25GSE-1556A



AIRLINE
MODELS 25GSE-1555A, 25GSE-1556A

Airline Model 25GSE-1555A

TRADE NAME	Airline Models 15GSE-1555A, 15GSE-1556A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (FIVE)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC/DC RATING .300 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1660KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to stator plates of rear section of tuning gang. Low side to B - .	455KC (400~mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1660KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

After alignment has been completed replace chassis in cabinet, turn tuning gang fully closed and set dial pointer parallel with base of cabinet at low frequency end of dial.

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PARTS LIST AND DESCRIPTIONS

AIRLINE
MODEL 15GSE-1555A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AFC-AF Amp	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	MW25E24	PRS150/50-50		BRD5515A		TVA-2453	Filter
B	50	150							Filter
C2	200		MW23E18	SI200	D6-201	TM5T2	GP2K-201	5GA-T2	RF Coupling
C3	.05	200	MW23E216	P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C4	250	500	MW23E2027	1468-00025	D6-251	5W5T25	GP2K-251	1FM-325	Diode RF Filter
C5	.01	200	MW23E211	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C6A	.01								Audio Coupling
B	250		†MW23E2041-2		†PC-81				AF Amp. Plate
C									Output Grid
C7	.01	400	MW23E411	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Output Plate
C8	.05	600	MW23E416	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter
C9	.2	400	MW23E2021			NF10137		72P53	Line Isolation

† Items C6A, C6B, C6C, R6A, R6B are combined in one unit
When replacing Items seperately, C6B and C6C should total 250MMF

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	MW28E82	Q13-133	AG-60-Z	BSK-60-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

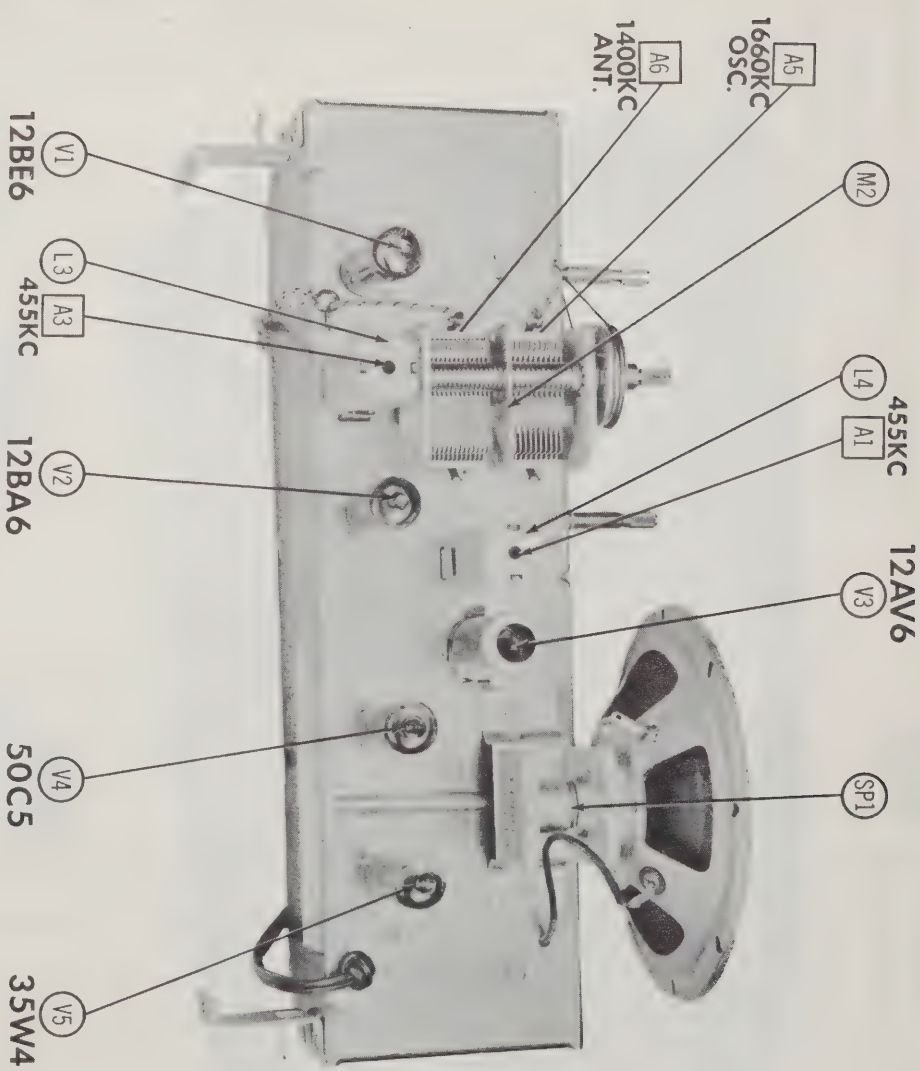
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	1Meg	1/3	MW27E105	BTS-1Meg	Converter Grid
R3	22KΩ	1/3	MW27E223	BTS-22K	Oscillator Grid
R4	3.3Meg	1/3	MW27E335	BTS-3.3Meg	AVC Network
R5	3.3Meg	1/3	MW27E335	BTS-3.3Meg	AF Grid
R6A	250KΩ		†MW23E2041-2	BTS-270K	AF Plate
B	500KΩ			BTS-470K	Output Grid
R7	150Ω	1/3	MW27E151	BTS-150	Output Cathode
R8	2200Ω	2	MW27E222-5	BTB-2200	Filter
R9	180Ω	1/2	MW27E181-2	BTS-180	Pilot Light Shunt

† Items C6A, C6B, C6C, R6A & R6B are combined in one unit

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	3.1KΩ	3.6Ω	265Ω	.64Ω	22E49-2		A-2903 ①	RO-301 ①	① Drill new mtg. holes

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	AIR LINE PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P.M.	3.6Ω	1E50	ST-105 Mod. P5-X	5A07	
	CONE DIA.	V. C. DIA.				
SP1B	4 6/8"	9/16"				

COILS (RF-IF)

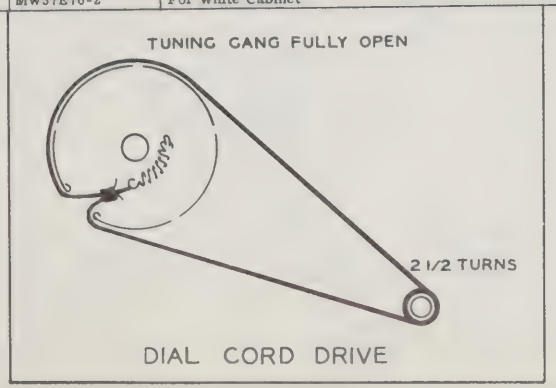
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AIR LINE PART No.	MERIT PART No.	
L1	Loop Ant.	2.6Ω		MW7E308		
L2	Osc. Coil	.8Ω	8.5Ω	MW20E733		
L3	Input IF	16Ω	15.2Ω	MW20E732	BC-352	
L4	Output IF	16Ω	15.2Ω	MW20E732	BC-353	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIR LINE PART No.		
M1	Bayonet	6-8	.15	Brown			Type No. #47

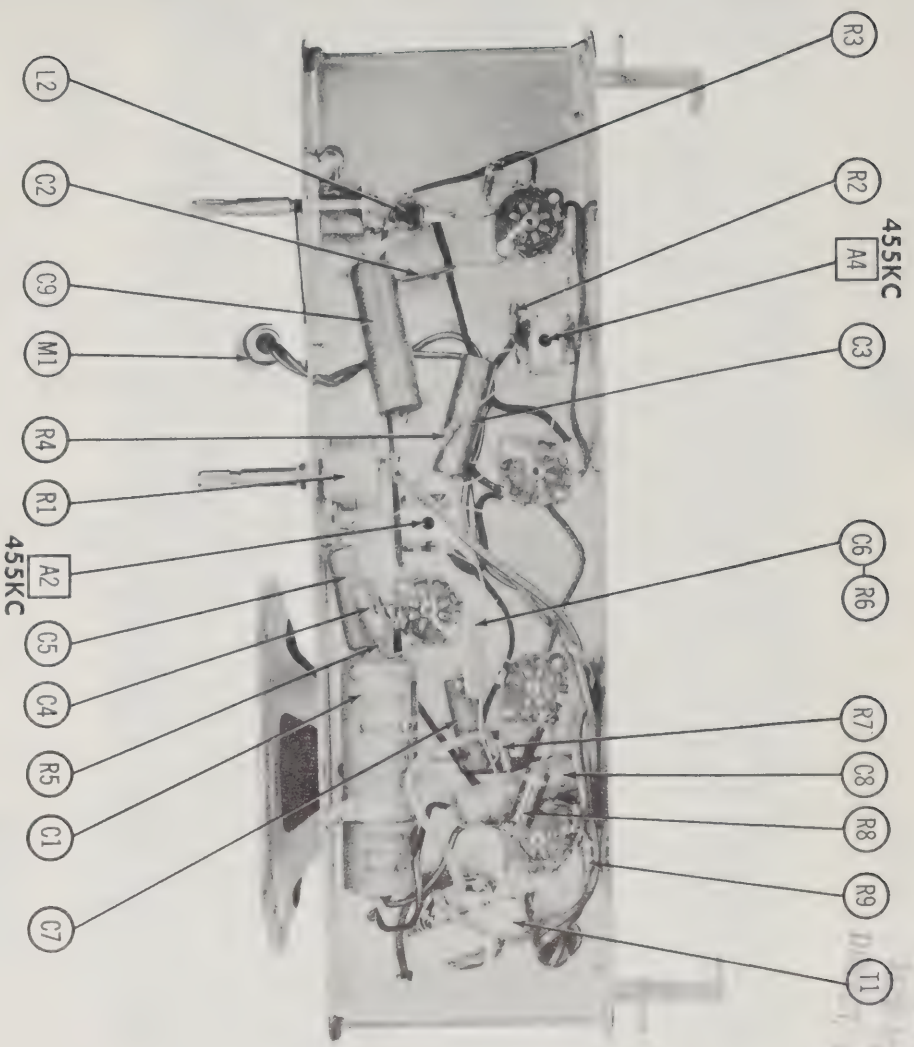
MISCELLANEOUS

ITEM No.	PART NAME	AIR LINE PART No.	NOTES
M2	2 Gang Var. Cap	MW24E58	(31-462MMF, 28-162MMF)
	Cabinet	MW7E306-2	Green
	Cabinet	MW7E306-3	White
	Dial Pointer	MW35E32	
	Knob	MW37E76	For Green Cabinet
	Knob	MW37E76-2	For White Cabinet

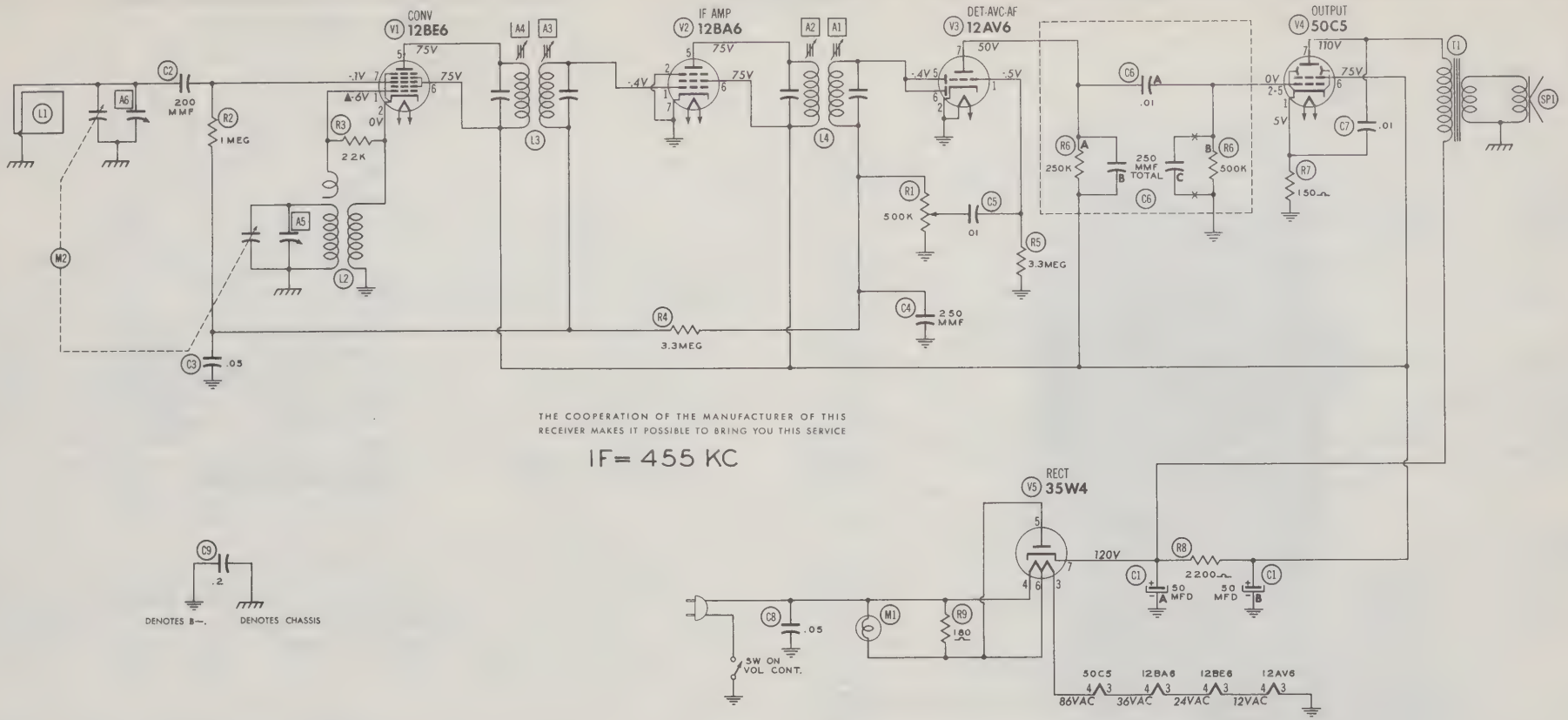


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



AIRLINE MODEL 15GSE-1555A



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF= 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	12Ω	24Ω	†2.2KΩ	†2.2KΩ	4.8Meg
V 2	12BA6	3.8Meg	0Ω	24Ω	36Ω	†2.2KΩ	†2.2KΩ	0Ω
V 3	12AV6	3.3Meg	0Ω	0Ω	12Ω	500KΩ	500KΩ	†250KΩ
V 4	50C5	150Ω	500KΩ	36Ω	86Ω	500KΩ	†2.2KΩ	†265Ω
V 5	35W4	0Ω	0Ω	86Ω	121Ω	105Ω	105Ω	60KΩ

† MEASURED FROM PIN 7 OF V5

▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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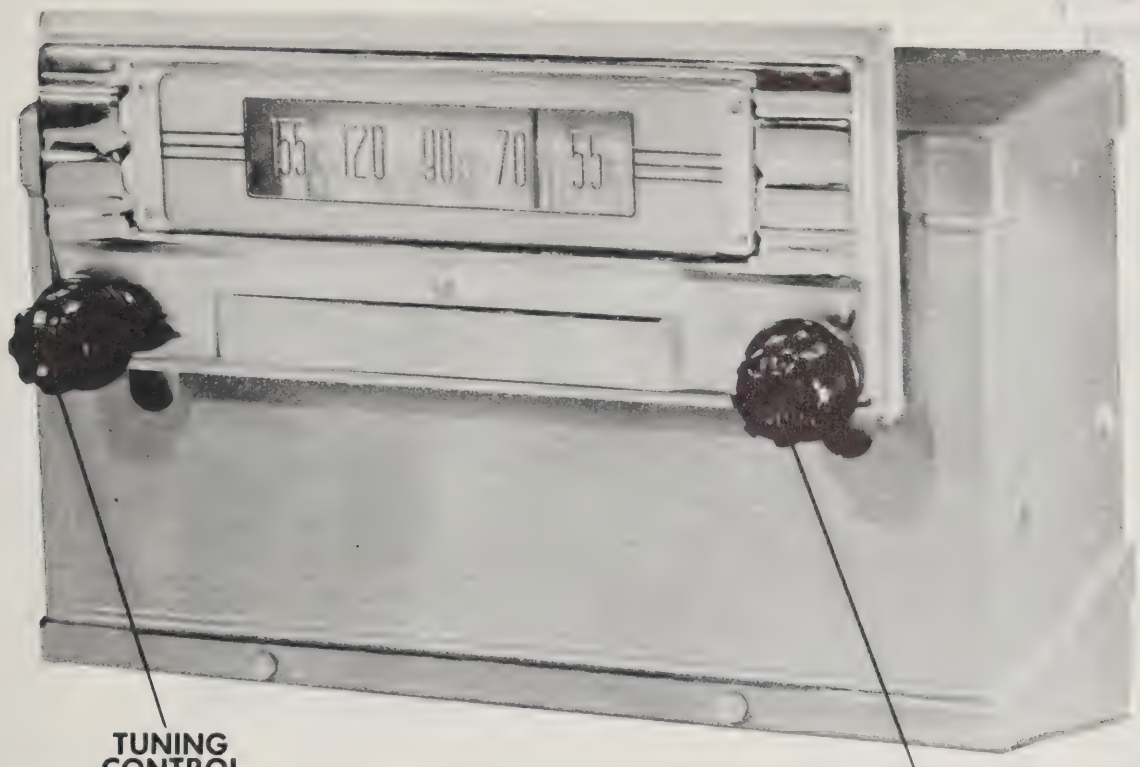
174-3

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



AUTOMATIC
MODEL D-251

AUTOMATIC
MODEL D-251

TRADE NAME	Automatic Model D-251 (For 1951 & 1952 Dodge Automobiles)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 or 6AV6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 5.2 Amp @ 6.3 Volts DC
TUNING RANGE—BROADCAST	538-1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully open and set pointer to coincide with the "1" in "155". Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2) Low side to chassis.	455 KC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	100MMF	High side to antenna lead. Low side to chassis.	1600 KC	"	"	A5	"
3.	"	"	1400 KC	Tune to 1400KC signal	"	A6, A7,	"
4.	"	"	600 KC	Tune to 600 KC signal	"	A8, A9	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		Automatic PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CK	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4A	Det.-AVC-AF Amp.	6AT6	6AT6	7BT	
B	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Automatic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	20	350	CE-86	AFH3-107		UP2235C			▲ Filter
B	20	350							■ Filter
C	20	25							Audio Output Cathode
C2	.05	200	C207	P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C3	.05	200	C207	P288-05	DF-503	PJ2S5		2TM-S5	Screen Bypass
C4	.05	200	C207	P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C5	100		CC200	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	Osc. Grid Cap.
C6	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	Diode RF Filter †
C7	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling ¶
C8	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	AF Amp. Grid Filter †
C9	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	AF Amp. Plate Bypass †
C10	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C11	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Output Plate
C12	.008	1600	C205			PTE16D8		MB-D8	Buffer Cap.
C13	.5	100	C209	P185-5		MP2P5		68P20	Hash Filter
C14	.5	100	C209	P185-5		MP2P5		68P20	Hash Filter

† Some models use 200MMF in this application (Part #CC201)
¶ Some models use .002MFD in this application (Part #C203)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESIST-ANCE	WATTS	Automatic PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1	750KΩ	½	RV-251				Volume control & SW-See note

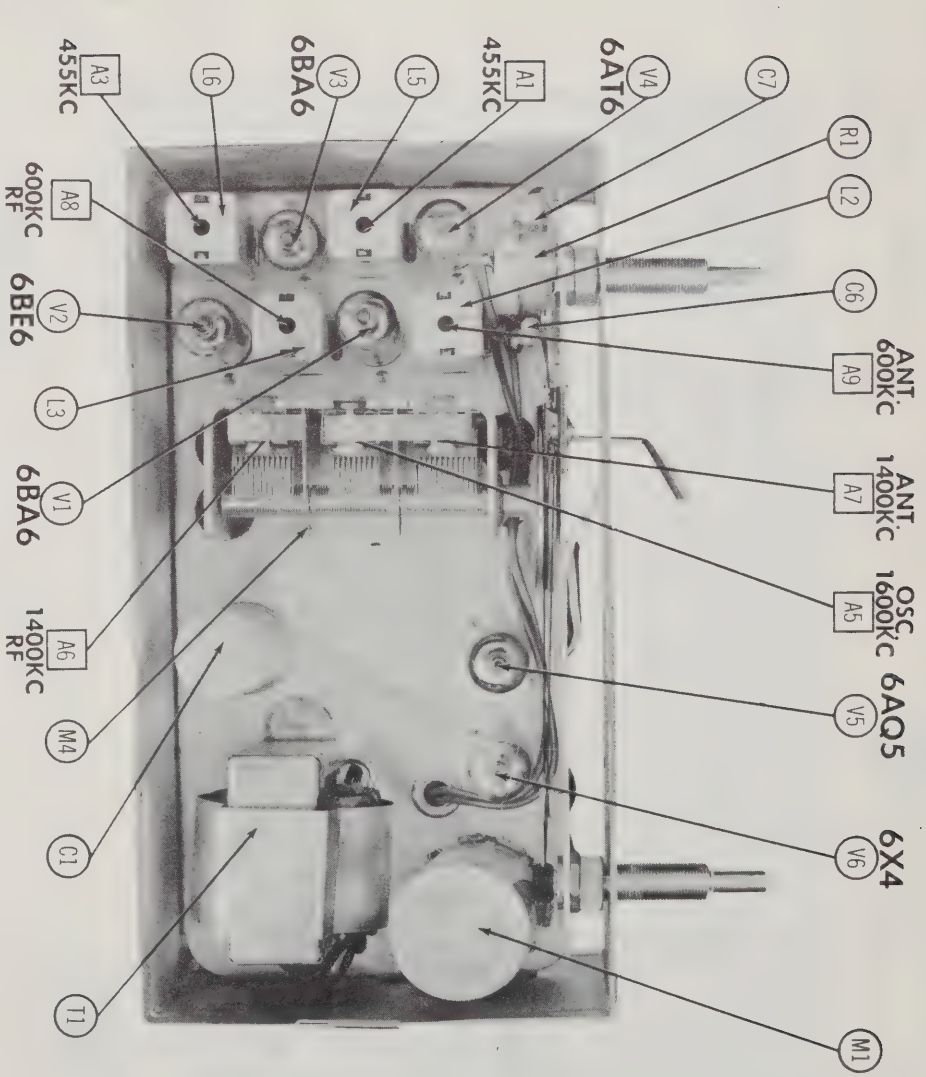
Note: Some models use alternate control (Part #RV-651)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Automatic PART No.	IRC PART No.	
R2	330Ω	½	R303	BTS-330	RF Amp. Cathode
R3	1.2Meg	½		BTS-1.2Meg	AVC Network - See Note 1
R4	20KΩ	½	R306		Osc. Grid
R5	1800Ω	½		BTS-1800	IF Amp. Cathode -See Note 2
R6	20KΩ	2	R313		Screen Dropping
R7	2Meg	½	R310		AVC Network
R8	8.2Meg	½		BTS-8.2Meg	AF Amp. Grid - See Note 3
R9	250KΩ	½	R307		AF Amp. Plate
R10	560KΩ	½		BTS-560K	Output Grid - See Note 4
R11	330	½	R303	BTS-330	Output Cathode
R12	1000Ω	1	R312	BTA-1000	Filter
R13	100Ω	½	R301	BTS-100	Hash Suppression
R14	100Ω	½	R301	BTS-100	Hash Suppression

Note 1. Some models use a 1Meg resistor in this application.
Note 2. Some models use a 1500Ω resistor in this application.
Note 3. Some models use a 10Meg resistor in this application.
Note 4. Some models use a 500KΩ resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	Automatic PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6VDC @ 3A	430VCT .046ADC			TV-100		P-2971	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Automatic PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	4.5KΩ	3.5Ω	300Ω	.5Ω	Part of Spkr.		A-2930	RO-8	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Automatic PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.5Ω	PM-252		4A07	
	CONE DIA.	V. C. DIA.				
SP1B	4 1/4"	9/16"				

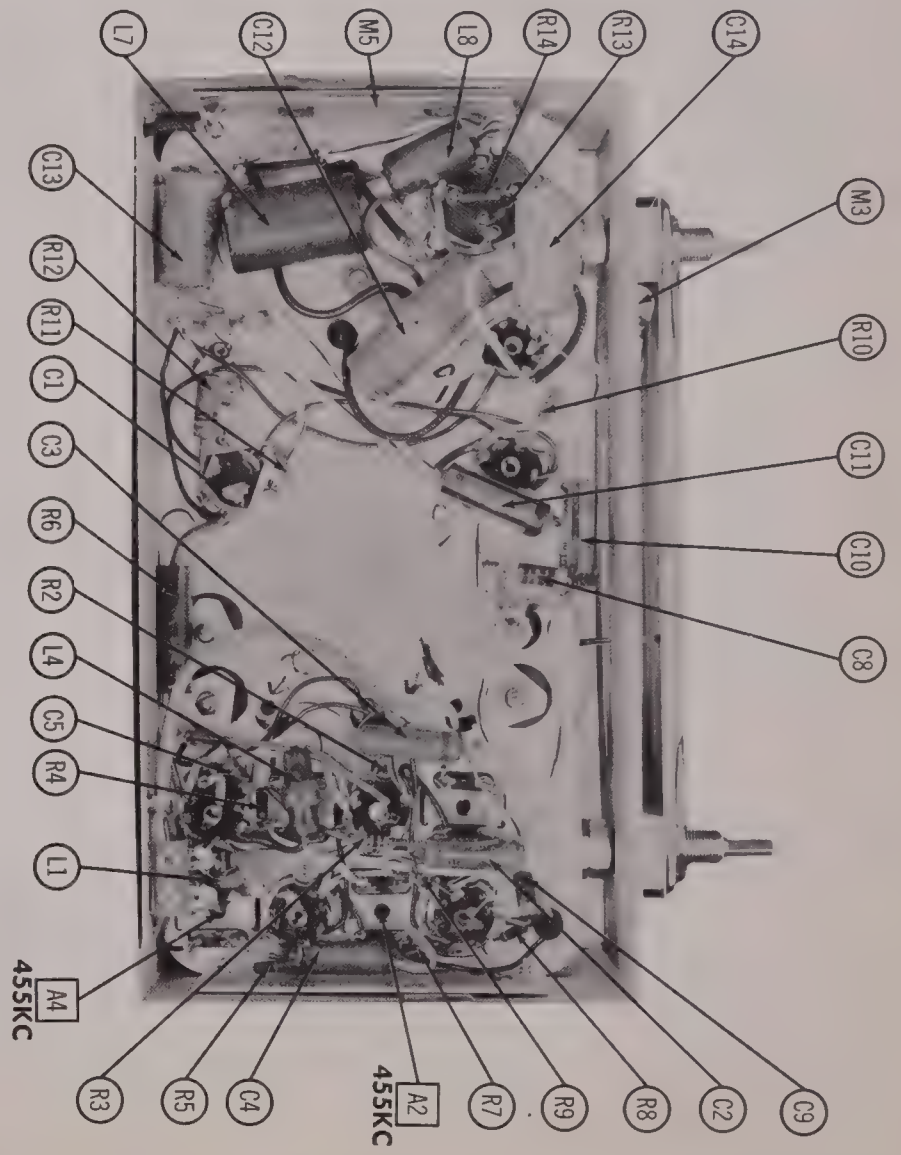
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Automatic PART No.	MERIT PART No.	
L1	Ant. Hash Choke	1.1Ω		L200		Wound on capacitor
L2	Ant. Coil	22Ω	5Ω	57FB-3		
L3	RF Coil	90Ω	6.2Ω	57FB-4		
L4	Osc. Coil	8.8Ω		L201		Tap @ .8Ω
L5	Input IF	18.5	18Ω	1655-16	BC-352	
L6	Output IF	19Ω	18.5Ω	1655-16	BC-353	
L7	Fil. Choke	0Ω		L203		
L8	Hash Choke	0Ω		L202		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				Automatic PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Interrupter	6.3 VDC	115∿	V-83	5301	5301	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

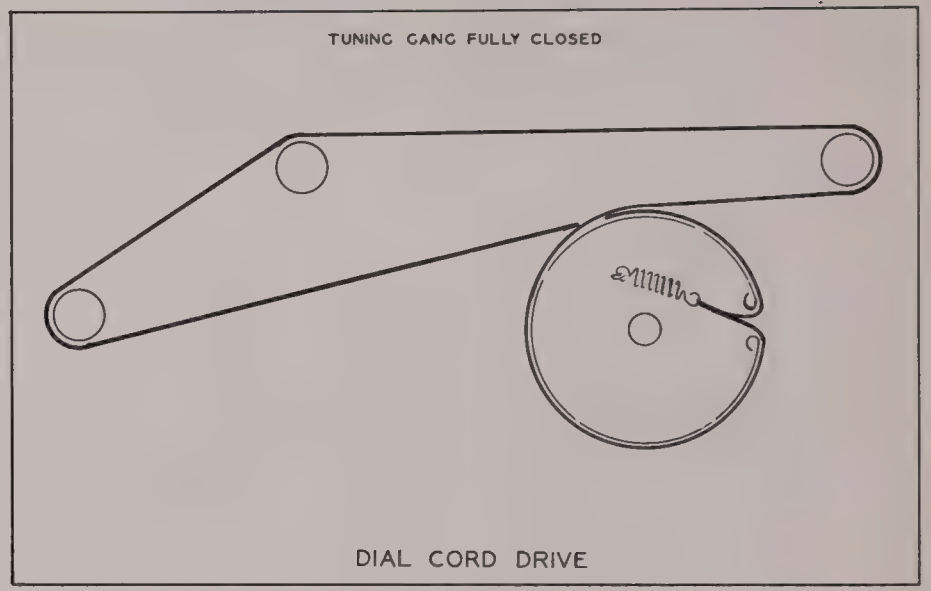
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Automatic PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	15A. 32V.	A201	A351	311015	155020	AGC15	HDJ-B

DIAL LIGHTS

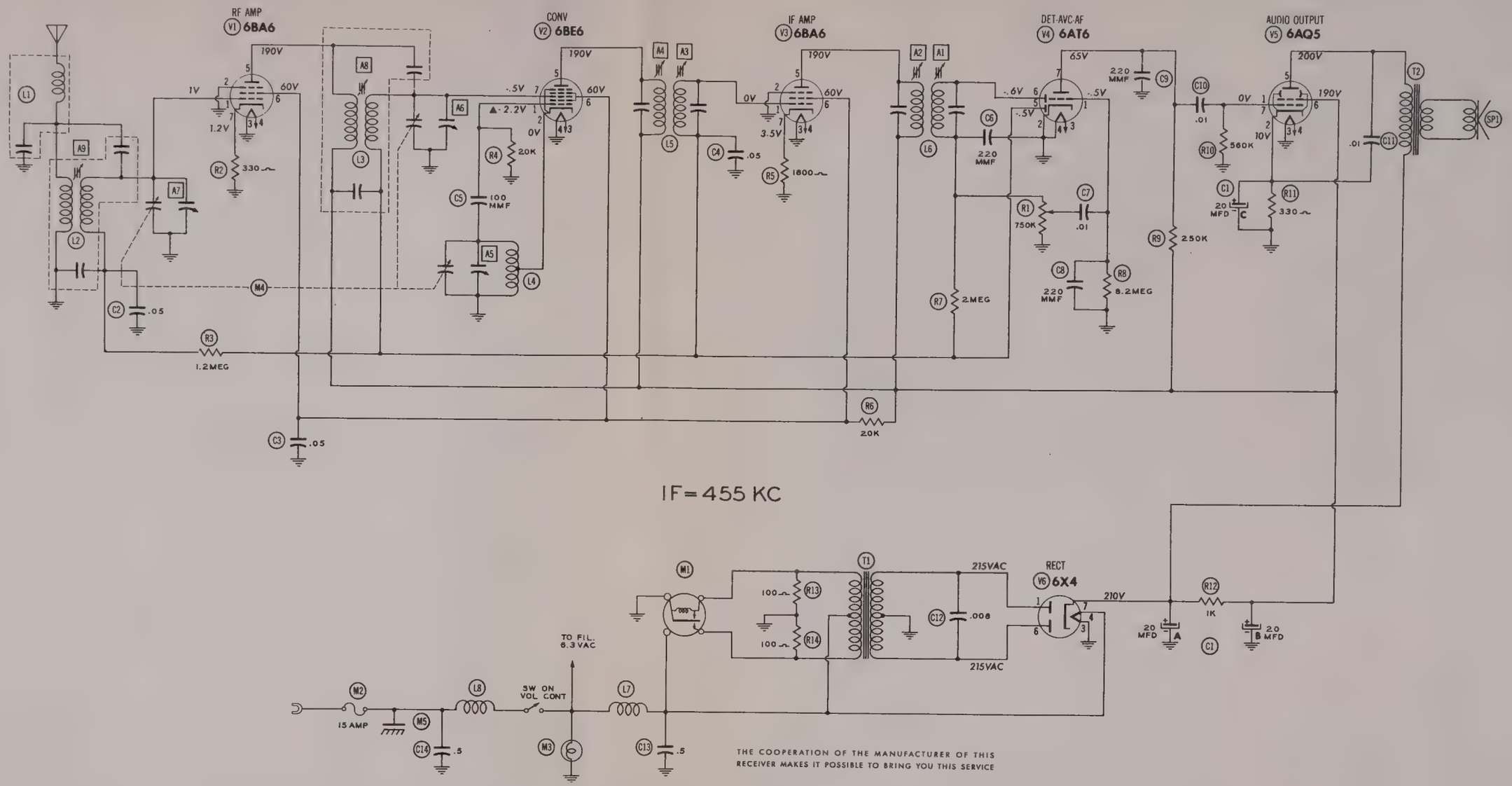
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Automatic PART No.		
M3	Bayonet	6-8	.15	Brown	T47		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	Automatic PART No.	NOTES
M4	3 Gang Var. Cap.	CV-200	(24-387MMF, 20-317MMF, 37-227MMF)
M5	Spark Plate		
	Dial Scale	D651	
	Pointer	PS651	



DIAL CORD DRIVE



IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	3.9Meg	0Ω	0Ω	.4Ω	†1.1KΩ	†21KΩ	330Ω
V 2	6BE6	22KΩ	.8Ω	.4Ω	0Ω	†1KΩ	†21KΩ	2.7Meg
V 3	6BA6	18Ω	0Ω	0Ω	.4Ω	†1KΩ	†21KΩ	1.8KΩ
V 4	6AT6	8.2Meg	0Ω	.4Ω	0Ω	2.7Meg	750KΩ	†250KΩ
V 5	6AQ5	560KΩ	330Ω	0Ω	.4Ω	†300Ω	†1KΩ	560KΩ
V 6	6X4	260Ω	INF	0Ω	.4Ω	INF	280Ω	60KΩ

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

† MEASURED FROM PIN 7 OF V6

▲ TAKEN WITH VACUUM TUBE VOLTMETER

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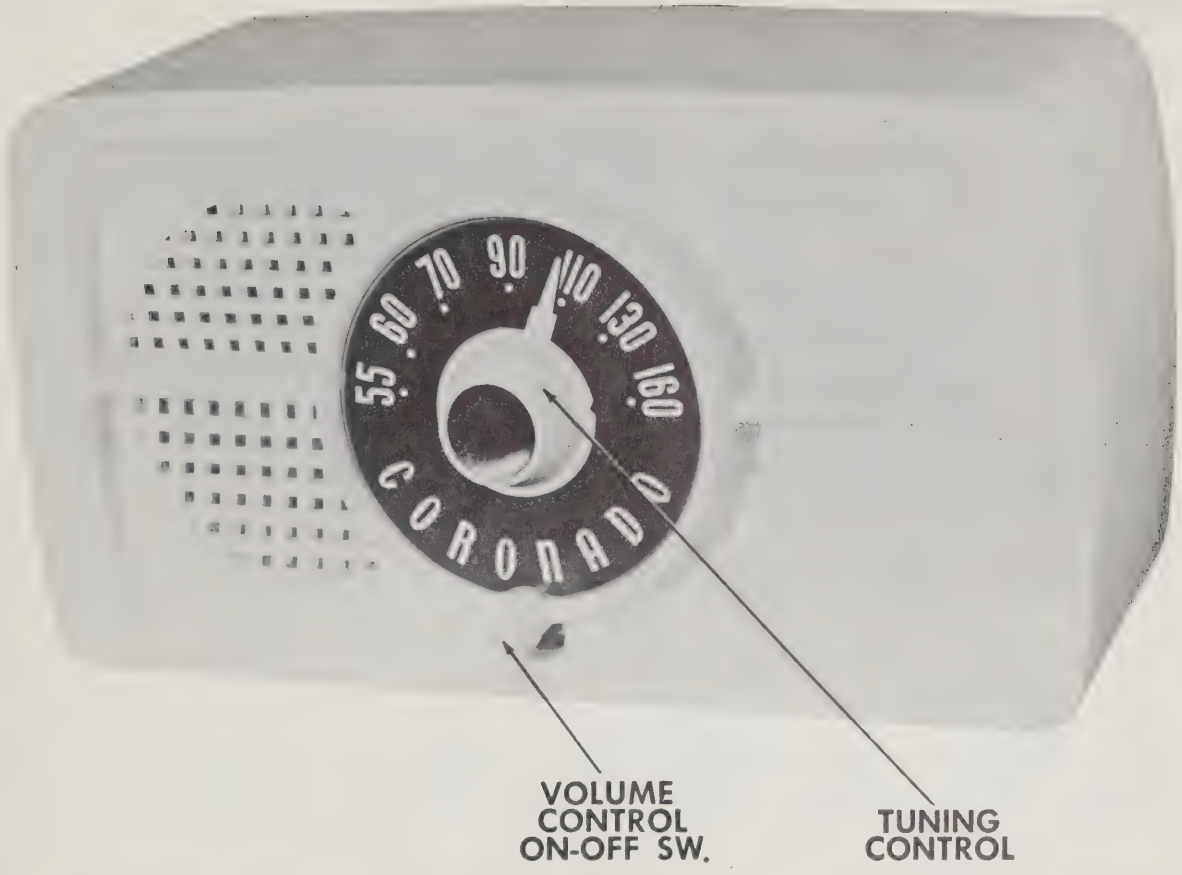
CORONADO MODELS
15RA33-43-8245A, 15RA33-43-8246A



CORONADO MODELS
15RA33-43-8245A, 15RA33-43-8246A

CORONADO MODEL 15RA33-43-8246A

TRADE NAME	Coronado Models 15RA33-43-8245A, 15RA33-43-8246A
SUPPLIER	Gamble-Skogmo, Inc., 15 N. 8th St., Minneapolis, Minn.
TYPE SET	AC-DC Operated AM Superheterdoyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 or 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC/DC RATING .260 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1630 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available, If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator plates of rear section of tuning gang. Low side to B-.	455 KC (400~ mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1625 KC	"	"	A5	"
3.		Loop	1400 KC	Tune in 1400 KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

CORONADO
MODEL 15RA33-43-8245A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		Coronado PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3A	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
B	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Coronado PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	C40-20-1.5	PRS150/40-20		EDL4215		TVA-2438	Red-Filter
B	20	150							Blue-Filter
C2	.05	200	C052	P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C3	.02	600	C026	P688-02	DF-203	PTE6S2		6TM-S2	Osc. Grid Cap.
C4A	100		♦CR1	SI100	♦PC-50	TM5T1	GP1K-101	♦100C1	Diode RF Filter
B	100			SI100		TM5T1	GP1K-101		Diode RF Filter
C5	.005	600	C0056	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C6	250	500	C2505M	1468-00025	D6-251	5W5T25	GP2K-251	1FM-325	AF Amp. Plate
C7	.005	600	C0056	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C8	.005	600	C0056	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Output Plate
C9	.05	400	C054	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter
C10	.1	400	C12	P488-1	DF-104	PTE4P1		4TM-P1	Line Isolation

♦ Items C4A, C4B, R4 are combined in one unit.

CONTROLS

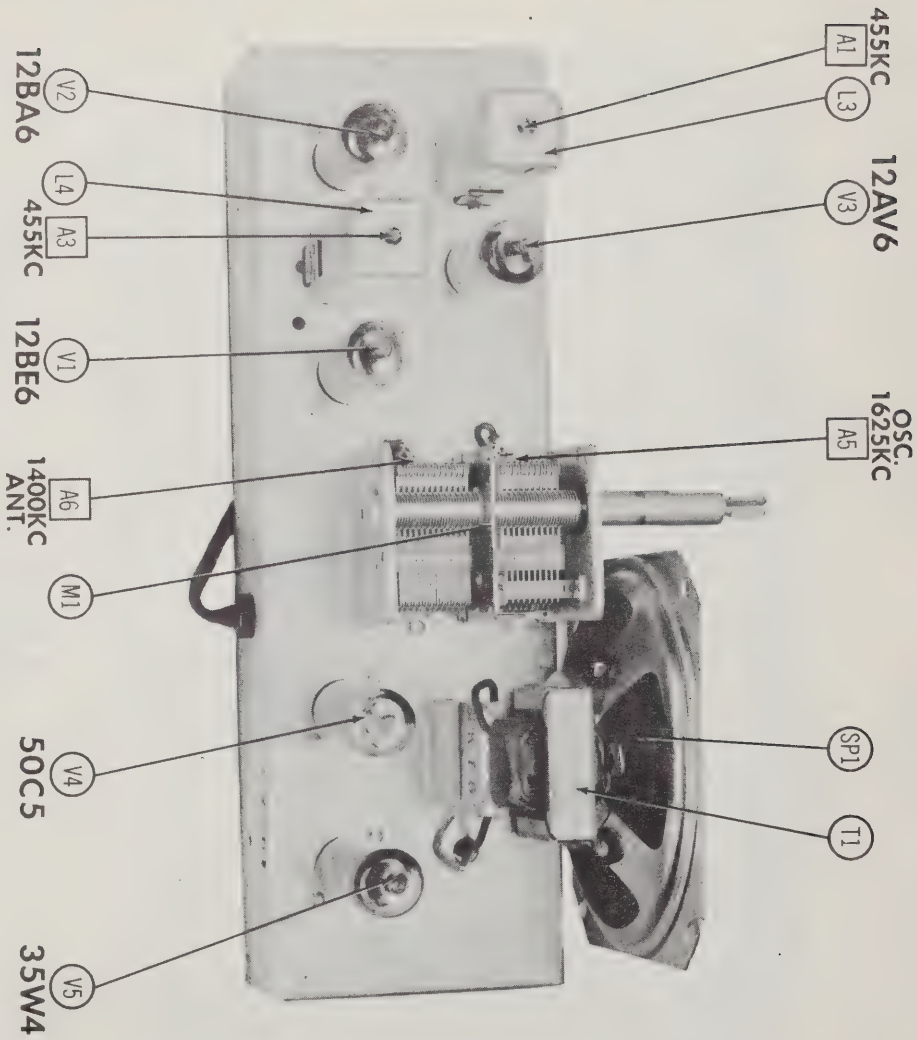
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Coronado PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	1Meg	½	VRT67G	Q13-137	AG-63-Z	BSK-70-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Coronado PART No.	IRC PART No.	
R2	22KΩ	½	R223.5	BTS-22K	Oscillator Grid
R3	390Ω	½	R391.5	BTS-390	IF Cathode
R4	47KΩ	½	♦CR1	BTS-47K	Diode Filter
R5	1Meg	½	R105.5	BTS-1Meg	AVC Network
R6	10Meg	½	R106.5	BTS-10Meg	AF Grid
R7	470KΩ	½	R474.5	BTS-470K	AF Plate
R8	470KΩ	½	R474.5	BTS-470K	Output Grid
R9	120Ω	½	R121.5	BTS-120	Output Cathode
R10	10KΩ	2	R1032	BTB-10K	Bias Network
R11	1000Ω	1	R1021	BTA-1000	Filter

♦ Items C4A, C4B and R4 are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Coronado PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.3K	3.2Ω	155Ω	.4Ω	Part of SPKT-67	A-3332 ①	A-3025 ①	RO-2 ①	① Bend mtg tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Coronado PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.2Ω	SPKT-67	ST-113 Mod. P-4X ①	4A07 ①	① Fabricate new mtg. bracket.
	CONE DIA.	V. C. DIA.				
SP1B	4"	9/16"				

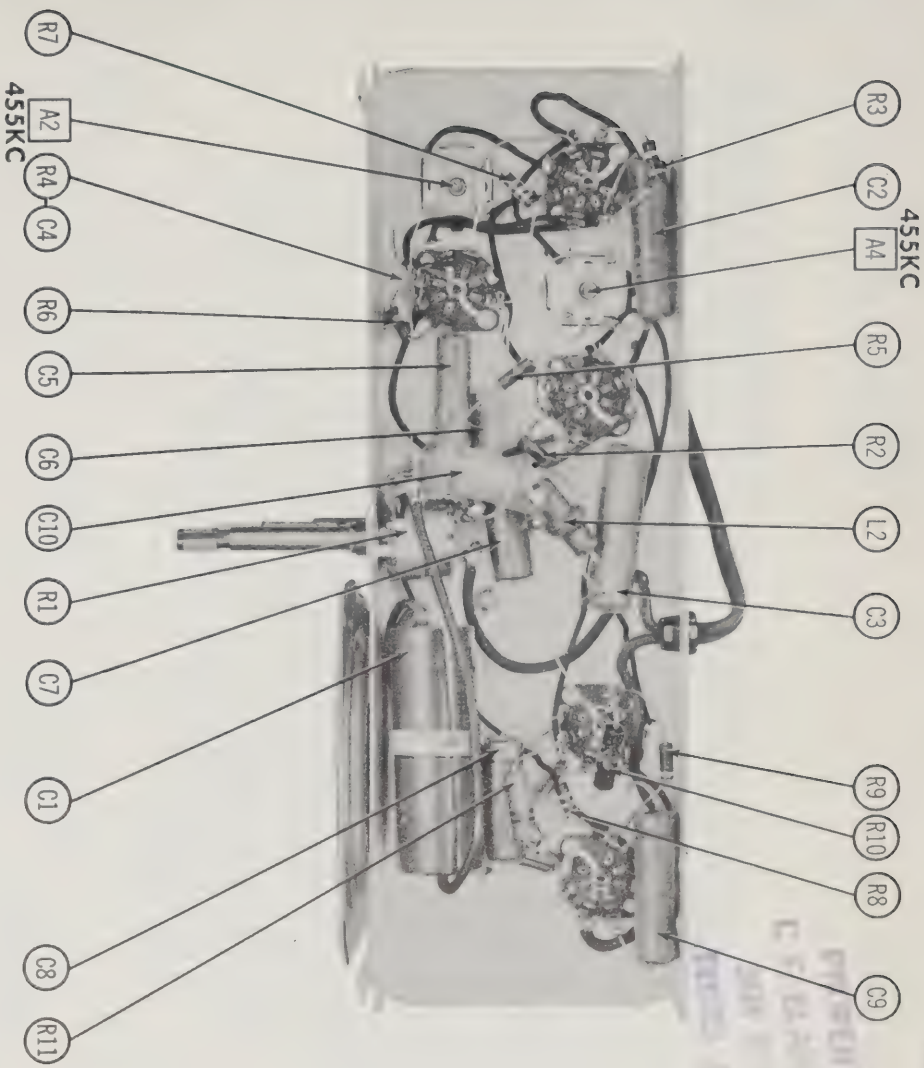
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Coronado PART No.	MERIT PART No.	
L1	Loop Ant.	.2Ω		LAT68A		
L2	Osc. Coil	4.4Ω		LOT67		Tap ⓐ .5Ω
L3	Input IF	18Ω	23Ω	T111-31-A	BC-352	
L4	Output IF	18Ω	23Ω	T111-31-A	BC-353	

MISCELLANEOUS

ITEM No.	PART NAME	Coronado PART No.	NOTES
M1	2 gang var. cap.	VCT68	(32-438MMF, 39-238MMF)
	Cabinet	P-1801R	Red
	Cabinet	P-1801IG	Ivory-Green Dial
	Dial Pointer	M1807	
	Knob	P-1704AR	Pointer-Red
	Knob	P-1704AI	Pointer-Ivory
	Knob	P-1704R	Round-Red
	Knob	P-1704I	Round-Ivory

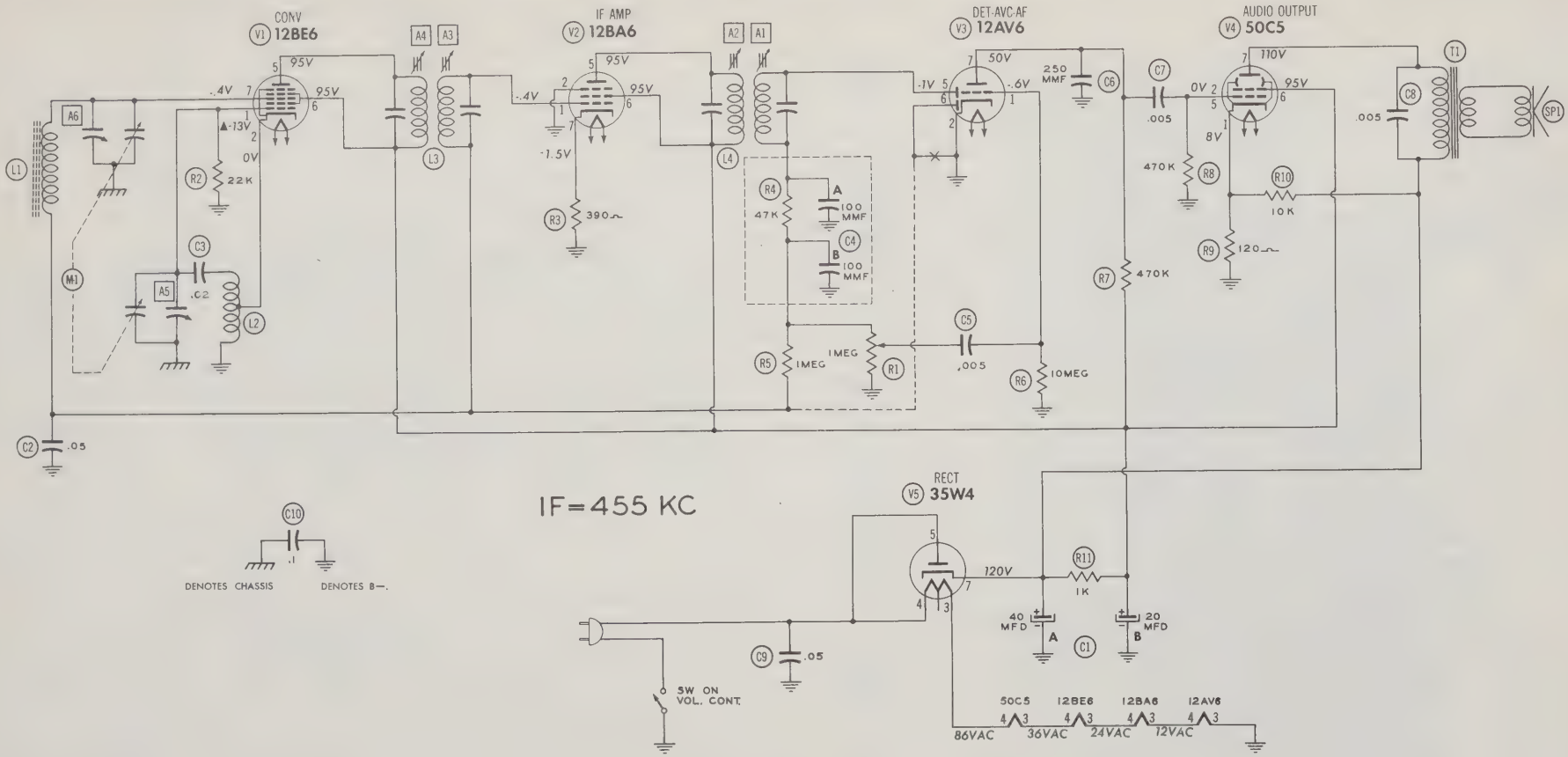
CHASSIS—BOTTOM VIEW



SET 174 FOLDER 5

CORONADO MODEL 15RA33-43-8245A

CORONADO MODEL 15RA33-43-8245A



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	24Ω	36Ω	†1KΩ	†1KΩ	2Meg
V 2	12BA6	2Meg	0Ω	12Ω	24Ω	†1KΩ	†1KΩ	390Ω
V 3	12AV6	10Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†470KΩ
V 4	50C5	120Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	†155Ω
V 5	35W4	0Ω	INF	86Ω	121Ω	121Ω	103Ω	9KΩ

† MEASURED FROM PIN 7 OF V5
▲ TAKEN WITH VACUUM TUBE VOLTMETER

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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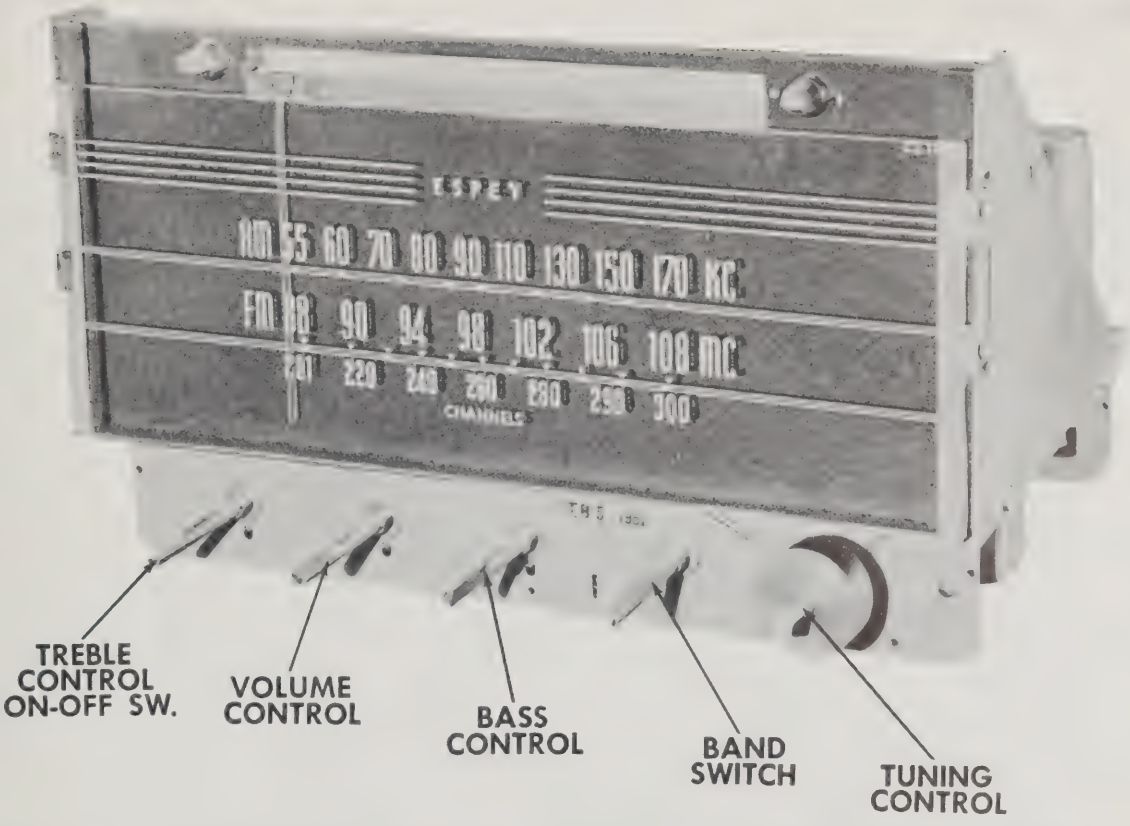
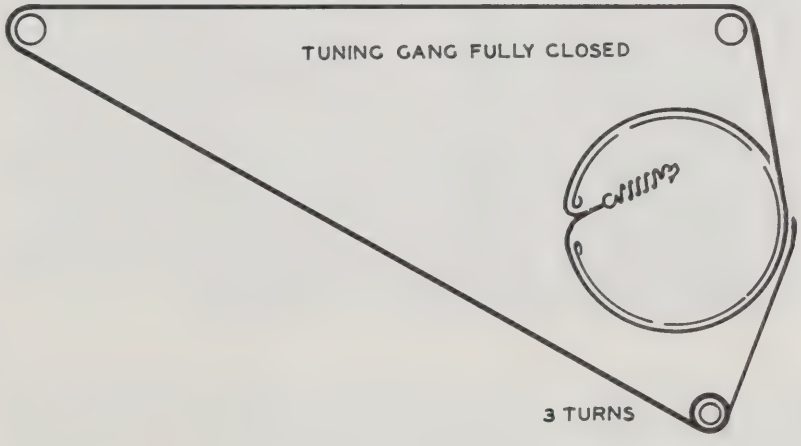
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ESPEY
MODEL 511C


ESPEY
AM 55 60 70 80 90 110 130 150 170 KC
FM 88 90 94 98 102 106 108 MC
200 220 240 260 280 298 300
CHANNELS
TREBLE CONTROL ON-OFF SW.
VOLUME CONTROL
BASS CONTROL
BAND SWITCH
TUNING CONTROL

ESPEY
MODEL 511C

TRADE NAME	Espey Model 511-C		
MANUFACTURER	Espey Mfg. Co., Inc., 528 E. 72nd. St., New York 21, N.Y.		
TYPE SET	AC Operated AM-FM Phono Combination Superheterodyne Receiver For Custom Installation		
TUBES	Fourteen		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING	.9 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	535-1720 KC	FREQ. MOD.	88-108 MC



DIAL CORD DRIVE

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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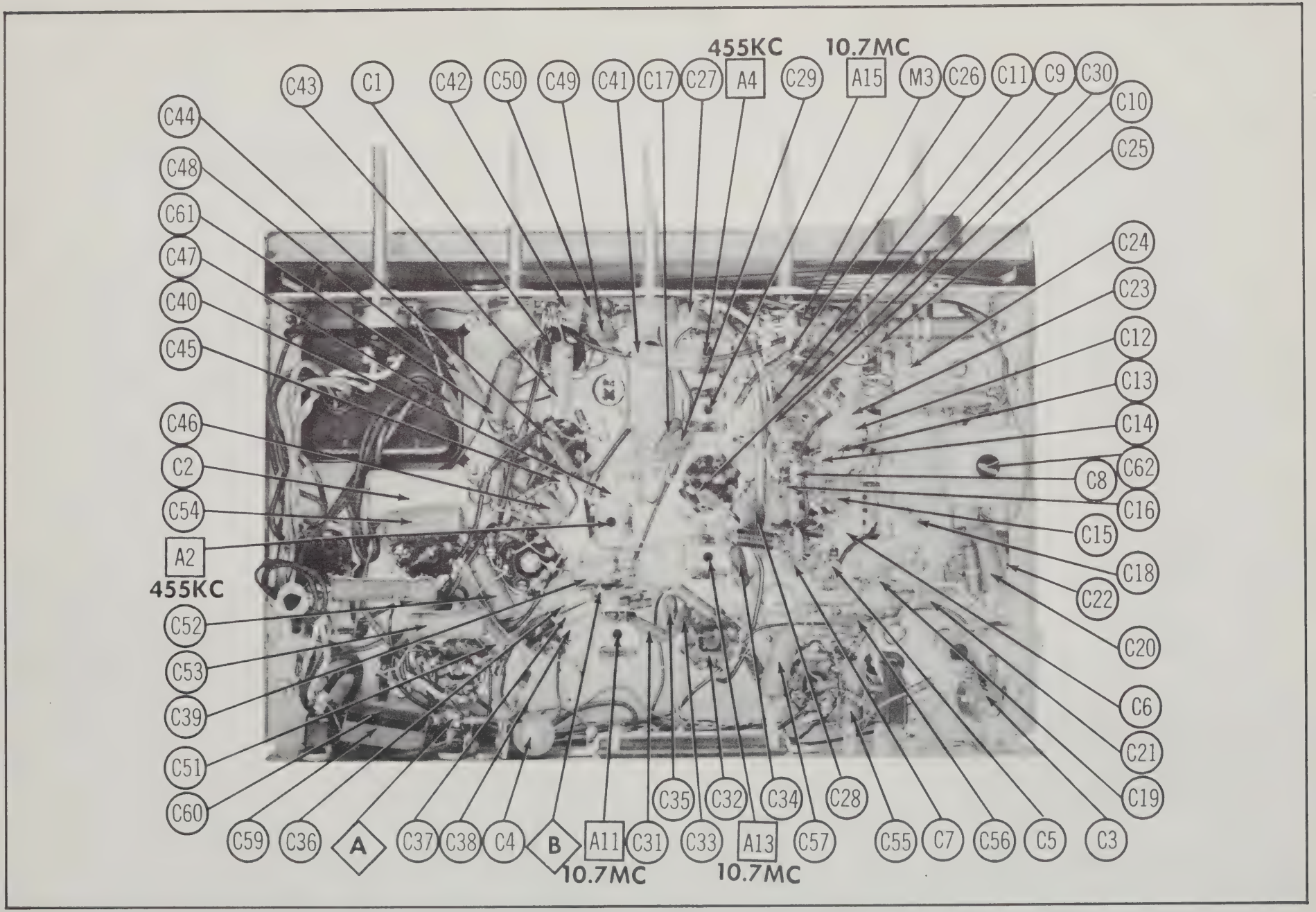
455KC
10.7MC
C43
C1
C42
C50
C49
C41
C17
C27
A4
C29
A15
M3
C26
C11
C9
C30
C10
C25
C44
C48
C61
C47
C40
C45
C24
C23
C12
C13
C14
C62
C8
C16
C15
C18
C22
C20
C6
C21
C19
C46
C2
C54
A2
455KC
C52
C53
C39
C51
C60
C59
C36
A
C37
C38
C4
B
A11
C31
C35
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C34
C28
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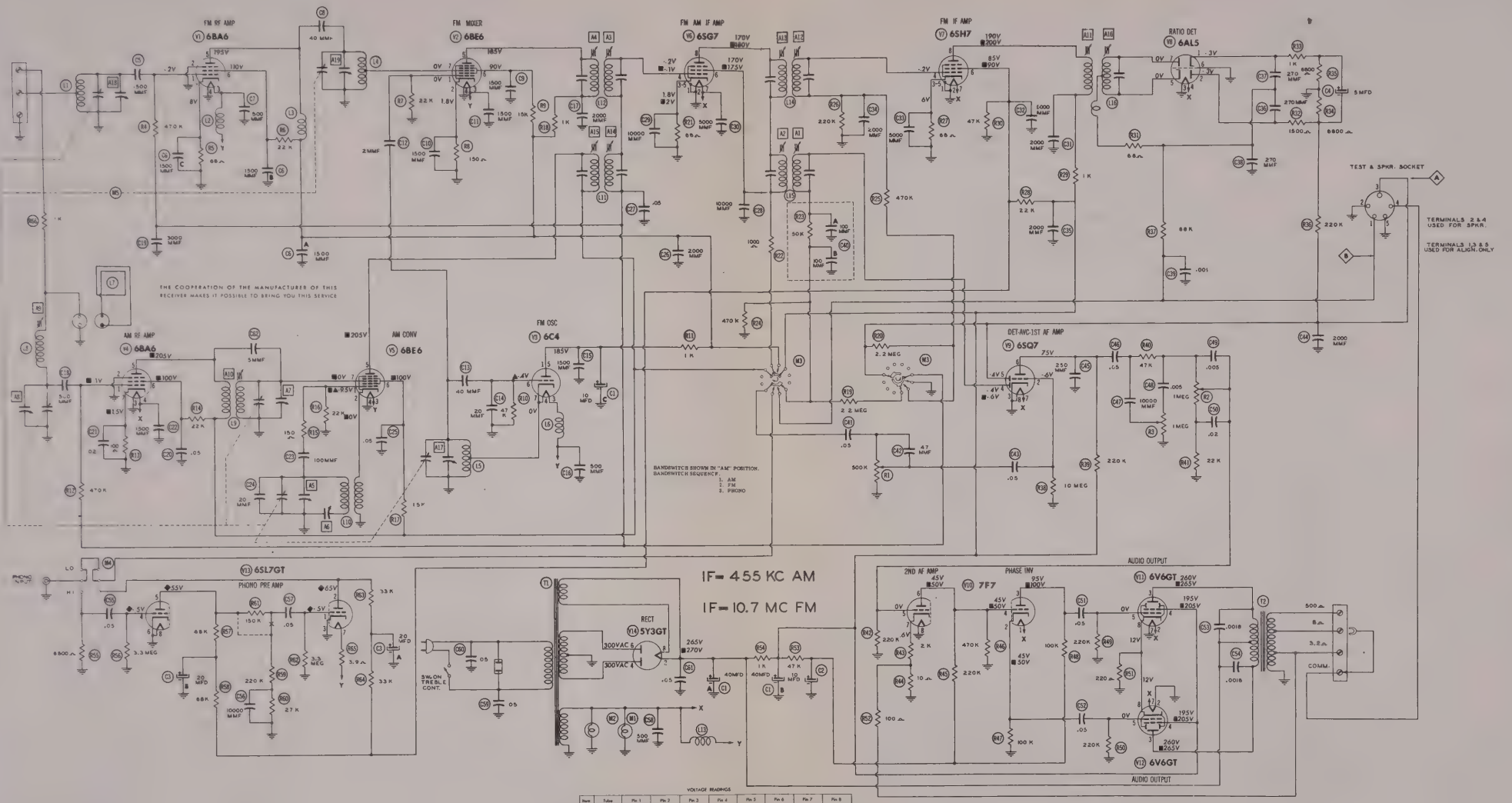
C5
C3
10.7MC
10.7MC



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V-1	6BA6	1.1Meg	0Ω	1Ω	0Ω	1KΩ	133KΩ	68Ω	
V-2	6BE6	33KΩ	150Ω	1Ω	0Ω	12KΩ	118KΩ	0Ω	
V-3	6C4	12KΩ	INF	1Ω	0Ω	12KΩ	47KΩ	0Ω	
V-4	6BA6	ø3.3Meg	0Ω	0Ω	1Ω	ø1KΩ	ø133KΩ	100Ω	
V-5	6BA6	33KΩ	1Ω	1Ω	0Ω	ø1KΩ	ø118KΩ	2.2Ω	
V-6	6SG7	0Ω	0Ω	68Ω	570KΩ ø3.3Meg	68Ω	12KΩ	1Ω	12KΩ
V-7	6SH7	0Ω	0Ω	68Ω	330KΩ	68Ω	118KΩ	1Ω	12KΩ
V-8	6AL5	1.8KΩ	8.3KΩ	0Ω	1Ω	INF	0Ω	INF	
V-9	6SQ7	0Ω	33Meg	0Ω	520KΩ	330KΩ	1210KΩ	1Ω	0Ω
V-10	7F7	1Ω	330KΩ	1150KΩ	1200KΩ	33KΩ	1200MΩ	1KΩ	0Ω
V-11	6V6GT	0Ω	1Ω	1330Ω	1KΩ	330KΩ	3Ω	0Ω	330Ω
V-12	6V6GT	0Ω	0Ω	1330Ω	1KΩ	330KΩ	0Ω	1Ω	330Ω
V-13	6SL7GT	3.3Meg	185KΩ	0Ω	3.3Meg	110KΩ	0Ω	1Ω	0Ω
V-14	5Y3GT	0Ω	40KΩ	INF	0Ω	INF	0Ω	INF	40KΩ

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS NOTED
† MEASURED FROM PIN 2 OF V14
ø MEASURED IN "AM" POSITION

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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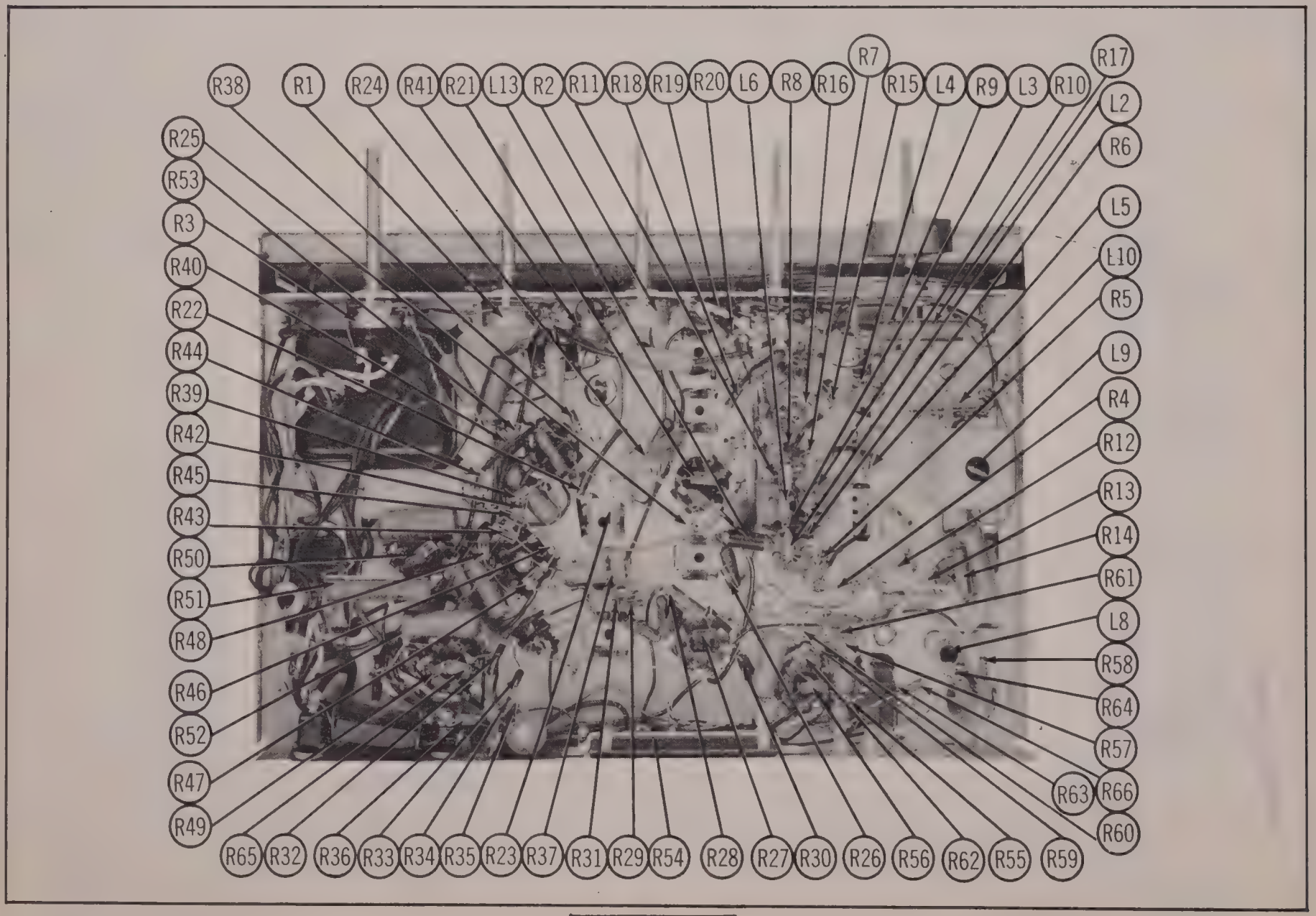
174-6



ESPEY
MODEL 511C

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 4 (grid) of 6SG7 (V6). Low side to chassis.	455 KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil	A1, A2	Adjust for maximum output.
2.	"	High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis.	"	"	"	A3, A4	"
3.	50MMF	High side thru 50MMF to AM antenna terminal. Low side to chassis.	1720 KC	"	"	A5	"
4.	"	"	535 KC	Tuning gang fully closed	"	A6	Adjust for maximum output. Repeat Step 3.
5.	"	"	1500 KC	Tune in 1500 KC signal	"	A7, A8	Adjust for maximum output.
6.	"	"	600 KC	Tune in 600 KC signal	"	A9, A10	Adjust A9 for maximum output. Adjust A10 to maximum counter-clockwise position, then clockwise to first output peak.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7	.01MFD	High side to pin 4 (grid) of 6SG7 (V6). Low side to chassis.	10.7MC (unmod.)	FM	Point of non-interference.	DC probe to Point (A). Common to chassis.	A11, A12, A13	Adjust for maximum deflection.
8	"	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	"	"	"	"	A14, A15	"
9	"	"	"	"	"	DC probe to Point (B). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7	.01MFD	High side to pin 4 (grid) of 6SG7 (V6). Low side to chassis.	10.7MC (unmod.)	FM	Point of non-interference.	Vert. amp. to Point (A). Low side to chassis.	A11, A12 A13	Disconnect stabilizer capacitor C4. Adjust for curve of maximum amplitude and symmetry as per fig. 1.
8	"	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	"	"	"	"	A14, A15	"
9	"	"	"	"	"	Vert. amp. to Point B . Low side to chassis.	A16	Reconnect capacitor C4. Adjust so that 10.7MC occurs at center of crossover lines as per fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

FM OSCILLATOR AND RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	270Ω Carbon Resistor	High side thru 270Ω to FM (middle) antenna terminal. Low side to chassis.	108.5MC (Unmod.)	FM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A17	Adjust for maximum deflection. Attenuate generator output to maintain 1.5 volts or less at point (A).
11.	"	"	87.5MC	"	Tuning gang fully closed	"	L5	Compress or expand coil, if necessary, for maximum deflection. Repeat steps 10 & 11.
12.	"	"	108 MC	"	Tune to 108 MC signal	"	A18,A19	Adjust for maximum deflection.
13.	"	"	88 MC	"	Tune to 88 MC signal	"	L1, L4	Check coils with tuning wand for tracking. If necessary compress or expand coils slightly for maximum deflection on VTVM. Repeat steps 12 and 13 if necessary.

FIG. 1

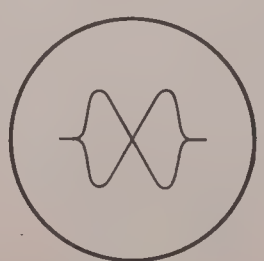


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

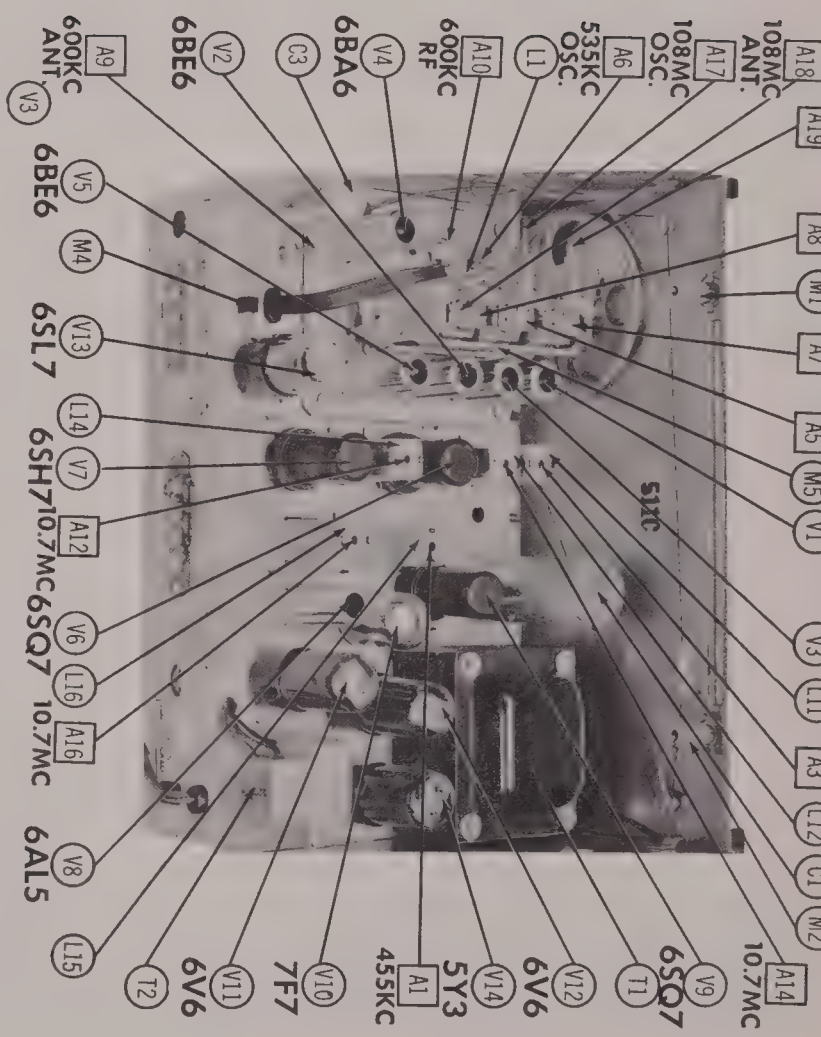
ITEM No.	USE	REPLACEMENT DATA: ESPEY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	FM RF Amplifier	6BA6	6BA6	7BK	
V2	FM Mixer	6BE6	6BE6	7CH	
V3	FM Oscillator	6C4	6C4	6BG	
V4	AM RF Amplifier	6BA6	6BA6	7BK	
V5	AM Converter	6BE6	6BE6	7CH	
V6	FM AM IF Amp.	6SG7	6SG7	8Q	
V7	FM IF Amplifier	6SH7	6SH7	8BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	Det.-AVC-1st. AF Amp.	6SQ7	6SQ7	8BK	
V10	2nd. AF Amplifier-Phase Inverter	7F7	7F7	8AC	
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	Audio Output	6V6GT	6V6GT	7AC	
V13A	Phono Pre-Amp.	6SL7GT	6SL7GT	8BD	
B	Phono Pre-Amp.	12AT7	12AT7	9A	
V14	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ESPEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH3-43		UPT44145		TVL-3785	■ Filter
B	40	450							▬ Filter
C	10	450							▲ FM Osc. Plate Bypass
C2	10	450		PRS450/10		BR1045A		TVA-1705	Filter
C3A	20	450		AFH2-51		UP2245		TVL-2755	■ Decoupling
B	20	450							▲ Decoupling
C4	5	250		PRS250/4		BR425		TVA-1501	Stabilizing Cap.
C5	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	FM RF Coupling
C6A	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	FM RF Amp. Plate
B	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	FM RF Amp. Screen
C	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	FM RF Amp. Cathode
C7	500			SI500	D6-501	TM5T5	GP2K-501	5GA-T5	FM RF Amp. Fil.
C8	40						NP0L-400		FM RF Coupling
C9	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	FM Mixer Screen
C10	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	FM Mixer Cathode
C11	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	FM Mixer Fil. Bypass
C12	2						NP0K-020		FM Osc. Coupling
C13	40						NP0L-400		FM Osc. Grid Cap.
C14	20						N150K-200		Fixed Trimmer
C15	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	FM Osc. Plate Bypass
C16	500			SI500	D6-501	TM5T5	GP2K-501	5GA-T5	FM Osc. Fil. Bypass
C17	2000			SI2000	D6-202	TM5D5	GP2-333-202	5HK-D2	FM Mixer Plate Dec.
C18	500			SI500	D6-501	TM5T5	GP2K-501	5GA-T5	AM RF Coupling
C19	3000			SI3000	D6-302	W5D3	GP2-333-302	1FM-23	AVC Filter
C20	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	AM RF Amp. Screen
C21	.02	200		P288-02	DF-203	PJ2S2		2TM-S2	AM RF Amp. Cathode
C22	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	AM RF Amp. Fil. Bypass
C23	100	500		1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	AM Osc. Grid Cap.
C24	20			SI20NP0	TCZ-20		NP0K-200		Fixed Trimmer
C25	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	AM Osc. Anode Bypass
C26	2000			SI2000	D6-202	TM5D2	GP2-333-202	5HK-D2	RF Bypass
C27	.05	200		P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C28	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	1st. IF Amp. Dec.
C29	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	1st. IF Amp. Cathode
C30	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. IF Amp. Fil.
C31	2000			SI2000	D6-202	TM5D2	GP2-333-202	5HK-D2	2nd. FM IF Amp. Plate
C32	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. FM IF Amp. Screen
C33	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. FM IF Amp. Cathode
C34	2000			SI2000	D6-202	TM5D2	GP2-333-202	5HK-D2	AVC Filter
C35	2000			SI2000	D6-202	TM5D2	GP2-333-202	5HK-D2	RF Bypass
C36	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Diode Load Cap.
C37	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Diode Load Cap.
C38	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	RF Bypass
C39	.001	200		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	De-Emphasis
C40A	100			SI100	♦ PC-50	TM5T1	GP1K-101	♦100C1	Diode RF Filter
B	100			SI100		TM5T1	GP1K-101		Diode RF Filter
C41	.05	200		P288-05	DF-503	PJ2S5		2TM-S5	Audio Coupling
C42	47			SI47	D6-470	TM5Q5	GP1K-470	5GA-Q47	Tone Comp.
C43	.05	200		P288-05	DF-503	PJ2S5		2TM-S5	Audio Coupling
C44	2000			SI2000	D6-202	TM5D2	GP2-333-202	5HK-D2	AVC Filter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

C45	250	500		1468-00025	D6-251	5W5T25	GP2K-251	1FM-325	AF Amp. Plate Bypass
C46	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C47	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	Tone Comp.
C48	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C49	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C50	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Tone Comp.
C51	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C52	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C53	.0018	1500		P1688-002		PTE16D2		MB-D2	Audio Output Plate †
C54	.0018	1500		P1688-002		PTE16D2		MB-D2	Audio Output Plate †
C55	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Phono Audio Coupling
C56	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	RF Bypass
C57	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Phono Audio Coupling
C58	500			S1500	D6-501	TM5T5	GP2K-501	5GA-T5	Fil. Bypass *
C59	.05	400		489ZGXY-05		PJ4S5		4TM-S5	Line Filter
C60	.05	400		489ZGXY-05		PJ4S5		4TM-S5	Line Filter
C61	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	RF Bypass *
C62	5			SI5NP0	TCZ-4.7		NP0K-050	5TCCB-V5	RF Coupling

* Not used in all models
♦ Items C40A, C40B, R23 are combined in one unit.
† Some models use .002MFD in this application

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	A9.127	Q13-133	AG-60-Z	B-60	Volume Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
R2A	1Meg	½	A9.129	Q13-137	AG-63-Z	B-70	Bass Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R2A per instructions
R3A	1Meg	½	A9.128	QB-137	AG-63-Z	B-70-S	Treble Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R3A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R3A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ESPEY PART No.	IRC PART No.	
R4	470KΩ	½		BTS-470K	FM-RF Amp. Grid
R5	68Ω	½			FM-RF Amp. Cathode
R6	22KΩ	1		BTA-22K	FM-RF Amp. Screen
R7	22KΩ	½		BTS-22K	FM-Mixer Inj. Grid
R8	150Ω	½		BTS-150	FM Mixer Cathode
R9	15KΩ	2		BTB-15K	FM Mixer Screen
R10	47KΩ	½		BTS-47K	FM Oscillator Grid
R11	1000Ω	½		BTS-1000	FM Oscillator Plate
R12	470KΩ	½		BTS-470K	AM-RF Amp. Grid
R13	100Ω	½		BTS-100	AM RF Amp. Cathode
R14	22KΩ	1		BTA-22K	AM RF Amp. Screen
R15	150Ω	½			Parasitic Suppressor
R16	22KΩ	½		BTS-22K	AM Oscillator Grid
R17	15KΩ	2		BTB-15K	AM Oscillator Anode
R18	1000Ω	½		BTS-1000	FM Mixer Plate Dec.
R19	2.2Meg	½		BTS-2.2 Meg	AVC Network
R20	2.2Meg	½		BTS-2.2Meg	AVC Network
R21	68Ω	½			1st.IF Amp. Cathode
R22	1000Ω	½		BTS-1000	1st.IF Amp. Decoupling
R23	50KΩ	½	♦	BTS-47K	Diode RF Filter
R24	470KΩ	½		BTS-470K	Diode Load
R25	470KΩ	½		BTS-470K	AVC Network
R26	220KΩ	½		BTS-220K	2nd.IF Amp. Grid
R27	68Ω	½			2nd.IF Amp. Cathode
R28	22KΩ	1		BTA-22K	2nd.IF Amp. Screen
R29	1000Ω	½		BTS-1000	2nd.IF Amp. Plate Dec.
R30	47KΩ	1		BTA-47K	Voltage Divider
R31	68Ω	½			Balancing
R32	1500Ω	½		BTS-1500	Balancing
R33	1000Ω	½		BTS-1000	Balancing
R34	6800Ω	½		BTS-6800	Ratio Det. Diode Load
R35	6800Ω	½		BTS-6800	Ratio Det. Diode Load
R36	220KΩ	½		BTS-220K	AVC Network
R37	68KΩ	½		BTS-68K	De-emphasis
R38	10Meg	½		BTS-10Meg	1st. AF Amp. Grid
R39	220KΩ	½		BTS-220K	1st.AF Amp. Plate
R40	47KΩ	½		BTS-47K	Tone Compensation
R41	22KΩ	½		BTS-22K	Tone Compensation
R42	220KΩ	½		BTS-220K	2nd.AF Amp. Grid
R43	2200Ω	½		BTS-2200	2nd.AF Amp. Cathode
R44	10Ω	½			2nd.AF Amp. Cathode
R45	220KΩ	½		BTS-220K	2nd.AF Amp. Plate
R46	470KΩ	½		BTS-470K	Phase Inv. Grid
R47	100KΩ	½		BTS-100K	Phase Inv. Cathode
R48	100KΩ	½		BTS-100K	Phase Inv. Plate
R49	220KΩ	½		BTS-220K	Output Grid
R50	220KΩ	½		BTS-220K	Output Grid
R51	220Ω	10		1 3/4A-225	Output Cathode - Wire Wound
R52	100Ω	½		BTS-100	Audio Feedback
R53	47KΩ	½		BTS-47K	Decoupling
R54	1000Ω	15		2D-1000	Filter - Wire Wound
R55	6800Ω	½		BTS-6800	Phono Shunt
R56	3.3Meg	½		BTS-3.3Meg	Phono Amp. Grid
R57	68KΩ	½		BTS-68K	Phono Amp. Plate
R58	68KΩ	½		BTS-68K	Phono Amp. Plate Dec.
R59	220KΩ	½		BTS-220K	Tone Compensation
R60	27KΩ	½		BTS-27K	Tone Compensation
R61	150KΩ	½		BTS-150K	Tone Compensation - See Note 1
R62	3.3Meg	½		BTS-3.3Meg	Phono Amp. Grid
R63	33KΩ	½		BTS-33K	Phono Amp. Plate
R64	33KΩ	½		BTS-33K	Phono Amp. Plate Dec.
R65	3.9Ω	1		BW-1-3.9	Filament Dropping
R66	1000Ω	½		BTS-1000	Antenna Loading

Note 1. Some Models may use a 180K Resistor in this application
♦ Items C40A, C40B & R23 are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	ESPEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .9A	600VCT .125ADC	5VAC @ 2A	6.3VAC @ 4.6A	B-18.076	PM-8410 ①		PH-120

① Add series resistor to reduce plate voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ESPEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	10KΩ CT	500Ω Tap @ 7.5Ω, 4Ω	440Ω CT	15Ω Tap @ .7Ω, .4Ω	A-15.038B		A-3027 ①		① Bend mtg. tabs down, file out slots and mount on original bracket.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ESPEY PART No.	MERIT PART No.	
L1	FM Ant. Coil	0Ω		N2.411		
L2	Fil. Choke	0Ω		N2.416		
L3	RF Choke	1Ω		A2.402		
L4	FM RF Coil	0Ω		N2.412		
L5	FM Osc. Coil	0Ω		N2.413		
L6	Fil. Choke	0Ω		N2.416		
L7	AM Loop Ant.	.6Ω		C5.027		
L8	AM Ant. Loading Coil	1.6Ω		B2.423		
L9	AM RF Coil	95Ω	2.3Ω	B2.409		
L10	AM Osc. Coil	.7Ω	7Ω	A2.410		
L11	1st.AM IF	9.6Ω	9.6Ω	N2.414	BC-352	
L12	1st.FM IF	.6Ω	.6Ω	N2.415	FM-254	
L13	Fil. Choke	0Ω		N2.439		
L14	2nd.FM IF	.6Ω	.6Ω	N2.415	FM-254	
L15	2nd.AM IF	9.6Ω	9.6Ω	N2.414	BC-353	
L16	Ratio Det.	1.6Ω	.8Ω	2.474		Tertiary Winding .3Ω

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ESPEY PART No.		
M1	Bayonet.	6-8	.25	Brown	112301		Type No. 47
M2	Bayonet	6-8	.25	Brown	112301		Type No. 47

MISCELLANEOUS

ITEM No.	PART NAME	ESPEY PART No.	NOTES
M3	Switch	A12.102	Function Selector
M4	Switch		Hi-Lo Gain (Phono)
M5	3 Gang Var. Cap.	B6.070	(AM Sections - 40-537MMF, 40-533MMF, 24-517MMF)
A6	Trimmer	C13518	AM Osc. Padder (500-1000MMF)
A17	Trimmer	N20.022	FM Osc. Adj. (1-8MMF)
A19	Trimmer	N20.022	FM RF Adj. (1-8MMF)

JACKSON MODEL JP-300

L. E. CLARK
3875 MEADE ST.
DENVER, COLORADO

JACKSON MODEL JP-300

JACKSON MODEL JP-300

TRADE NAME	Jackson Model JP-300
MANUFACTURER	Jackson Ind., Inc., 500 E. 40th. St., Chicago, Ill.
TYPE SET	AC Operated Audio Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .260 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE V-M MODEL 950 - PHOTOFACT SET #107, FOLDER 13 OR RECORD CHANGER MANUAL CM-3.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

JACKSON
MODEL JP-300

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		JACKSON PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12AT6	12AT6	7BT	
V2	Audio Output	50C5	50C5	7CV	
V3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	JACKSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/40-40		EDL4415		TVA-2445	Filter
B	40	150							Filter
C2	.006	600		P688-006		PTE6D6	GP2-333-602	6TM-D6	Audio Coupling
C3	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C4A	.01		♦		♦PC-80			♦102C1	Audio Coupling
B	250								AF Amp. Plate
C									Output Grid
C5	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Output Plate
C6	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Line Isolation

♦ Items C4A, C4B, C4C, R6A, R6B are combined in one unit.
When replacing items separately C4B and C4C should total 250MMF.

CONTROLS

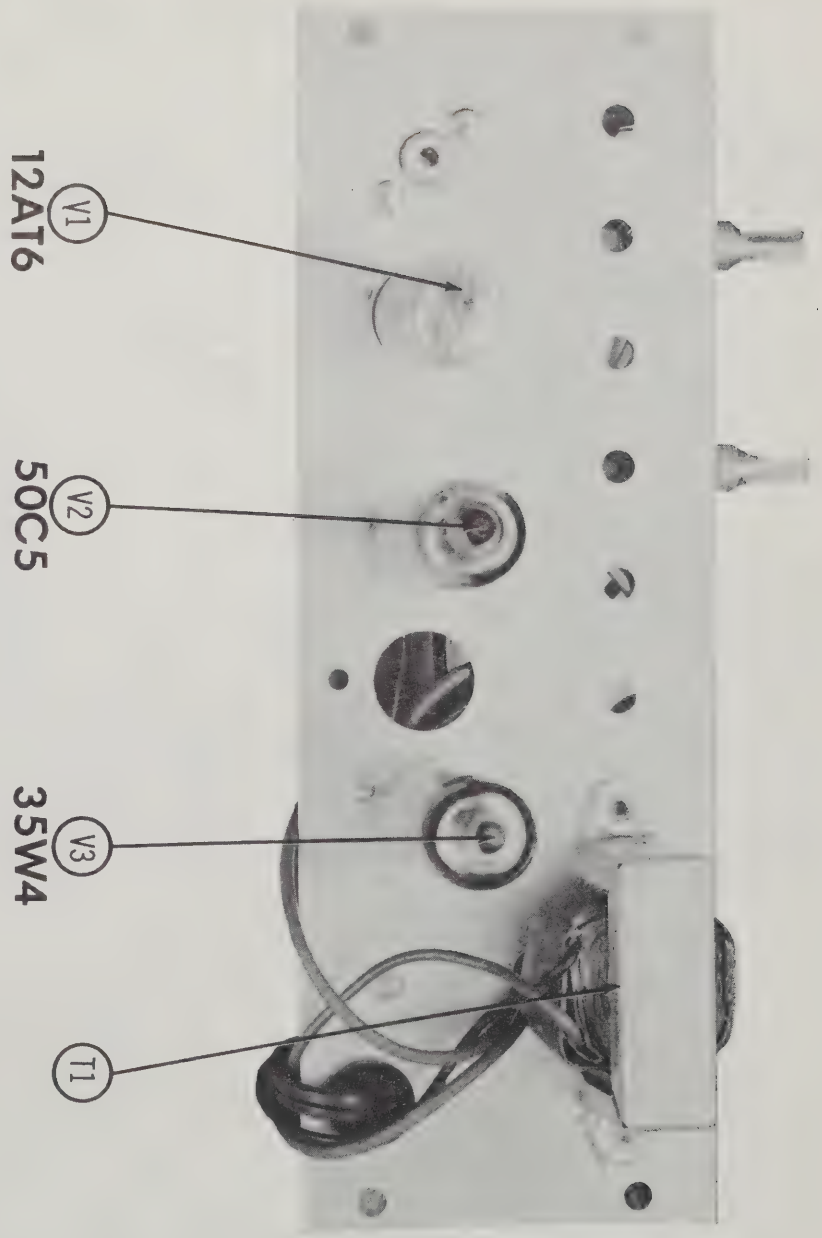
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	JACKSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	34-011-54	Q13-133	AG-60-Z	BSK-60-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions
R2A	500KΩ	½	34-011-54	Q13-133	AG-60-Z	BSK-60-S	Tone Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R2A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	JACKSON PART No.	IRC PART No.	
R3	680KΩ	½		BTS-680K	Phono Shunt
R4	1Meg	½		BTS-1Meg	Tone Compensation
R5	4.7Meg	½		BTS-4.7Meg	AF Amp. Grid
R6A	500KΩ	½	♦		AF Amp. Plate
B	500KΩ	½			Output Grid
R7	150Ω	2		BTS-150	Output Cathode
R8	2200Ω	2		BTS-2200	Filter
R9	15Ω	2			Rectifier Ballast
R10	120Ω	5			Series Filament -Wire wound

♦ Items R6A, R6B, C4A, C4B and C4C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		JACKSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	3.2KΩ	3.3Ω	151Ω	.57Ω	A-1658-13	A-3877	A-3018 ①	RO-302 ①	① Drill one new mtg. hole

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	JACKSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.Ω		ST-105 Mod. P5-X	5A07	
•	CONE DIA.	V. C. DIA.				
SP1B	5"	9/16"				

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	JACKSON PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A-1 A-3	W22AB	A62A A65MG	96	0-1 or S-1 and 0-3 or S-3	

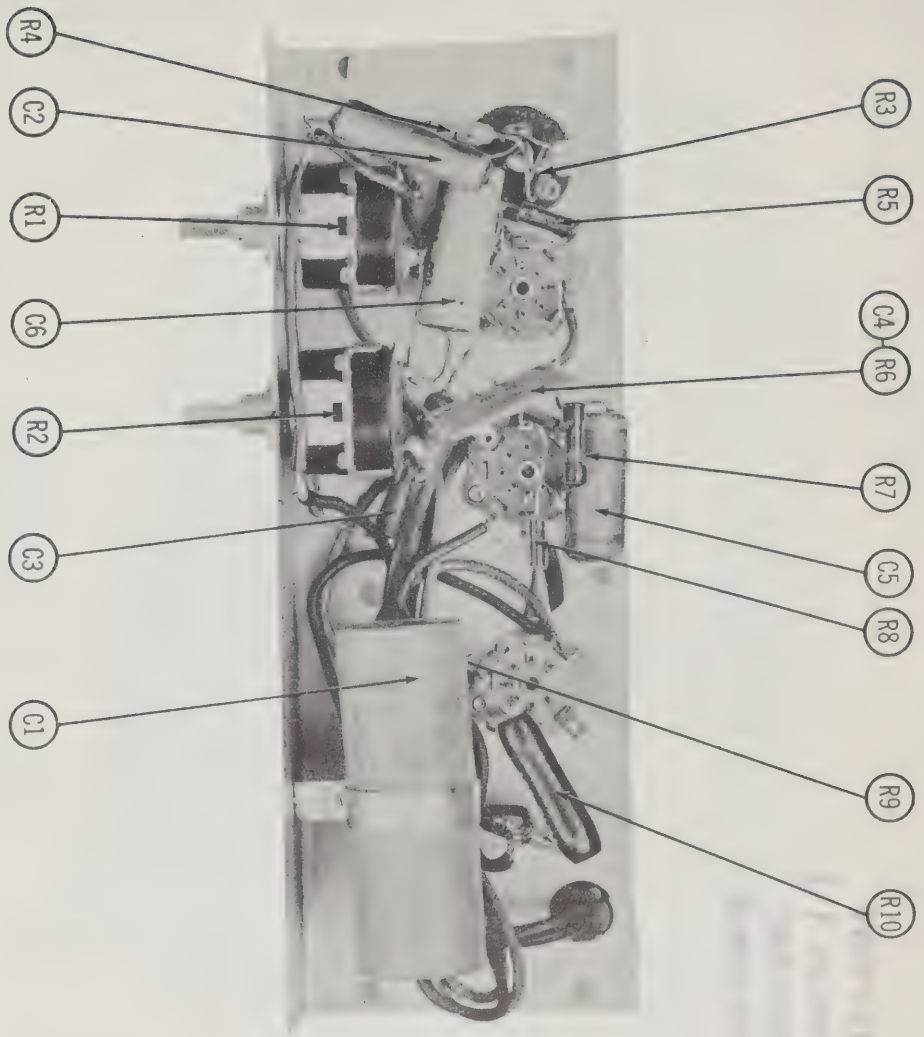
ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

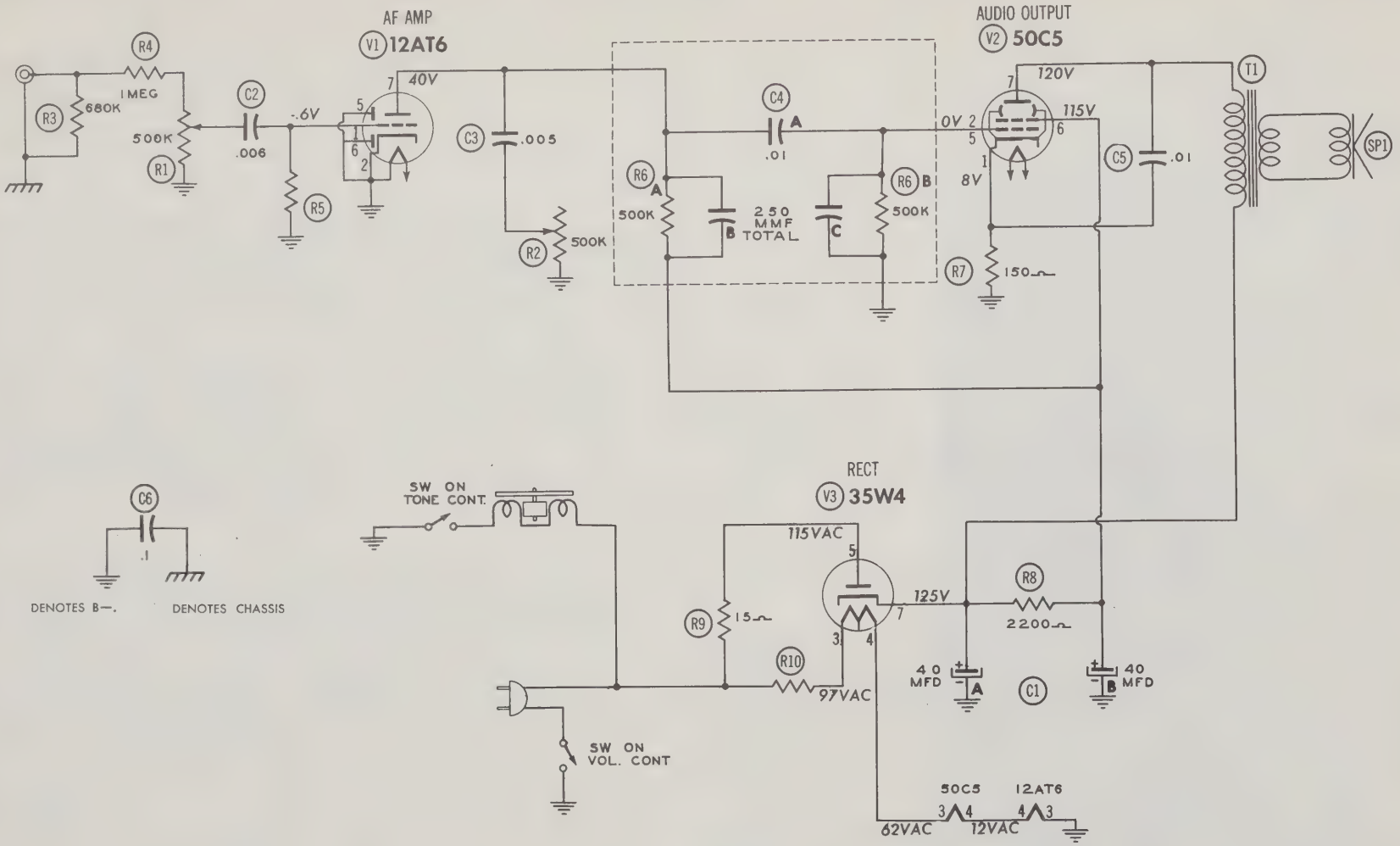
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	JACKSON PART No.	WALCO PART No.	JENSEN PART No.	
M2		W-30A and W-30MGS	JP-30 and JPS-30LP	

CHASSIS—BOTTOM VIEW



JACKSON MODEL JP-300



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AT6	4.7Meg	0Ω	0Ω	12Ω	0Ω	0Ω	†500K
V 2	50C5	12Ω	500KΩ	62Ω	12Ω	500KΩ	†2.2KΩ	†151Ω
V 3	35W4	INF	INF	97Ω	62Ω	232Ω	79Ω	60KΩ

† MEASURED FROM PIN 7 OF V3.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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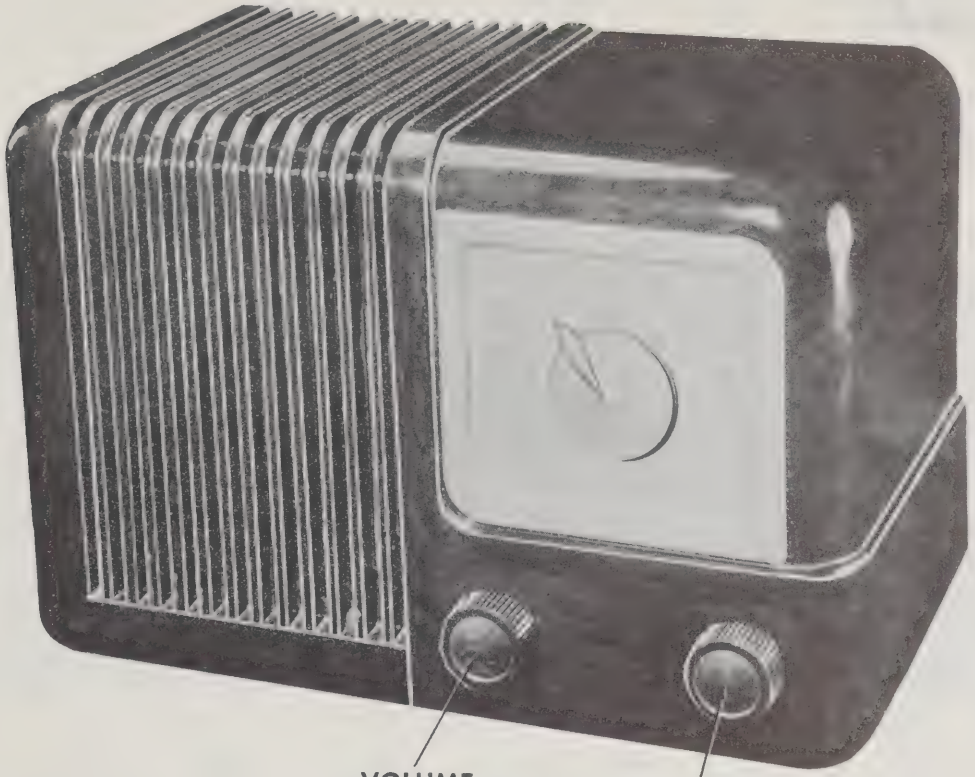
THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

174-7

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

KNIGHT MODEL 5J705

KNIGHT MODEL 5J705



KNIGHT MODEL 5J705

TRADE NAME	Knight Model 5J705
SUPPLIER	Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12SA7GT Conv., 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.250 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1630 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Use isolation transformer, if available. If not, connect a.1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8 (grid) of 12SA7 (V1) Low side to B-.	455 KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1630KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC	"	A6	Adjust for maximum output.
4.		"	600KC	Tune to 600KC Signal	"		Check tracking at 600KC. If necessary bend outer plates of rear section of tuning gang slightly for maximum output. Repeat steps 2 and 3.

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PARTS LIST AND DESCRIPTIONS

KNIGHT MODEL 5J705

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: KNIGHT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7GT	12SA7GT	8AD	
V2	IF Amplifier	12SK7GT	12SK7GT	8N	
V3	Det.-AVC-AF Amp.	12SQ7GT	12SQ7GT	8Q	
V4	Audio Output	50L6GT	50L6GT	7AC	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150		PRS150/50-50		EDL5515		TVA-2453	Filter
B	50	150							Filter
C2	50	500		1468-00005	D6-500	5W5Q5	GP1K-500	1FM-45	Osc. Grid Cap.
C3	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	AVC Filter
C4	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	IF Amp. Cathode
C5A	220			SI220	D6-221	5W5T25	GP2K-221		Diode RF Filter
B	.002			BPD-002	DD-202	TM5D2	801-002	34C4	Audio Coupling
C	220			SI220	D6-221	5W5T25	GP2K-221		AF Amp. Plate
D	.005			BPD-005	DD-502	TM5D5	811-005		Audio Coupling
C6	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Rectifier Plate
C7	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Line Isolation
C8	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Output Plate
C9	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	RF Bypass

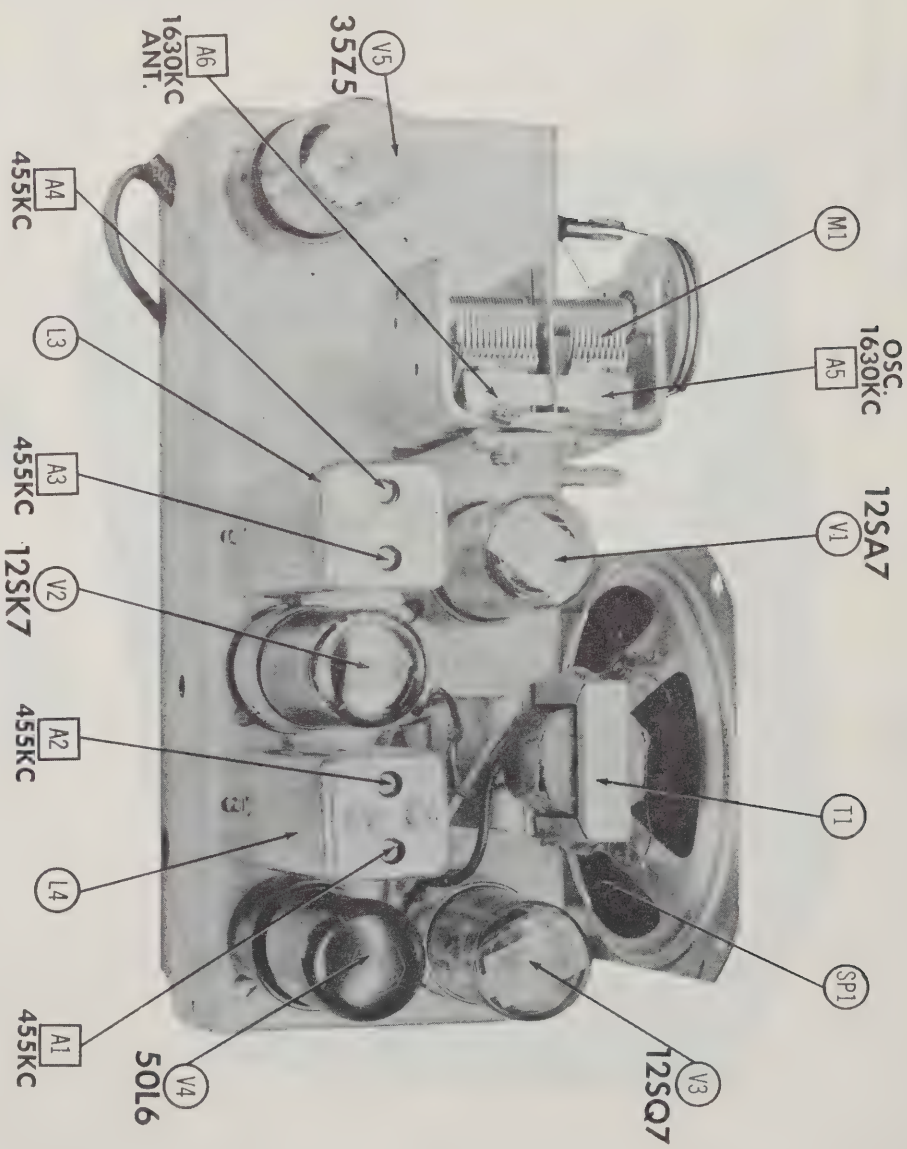
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	1/2	VC-3	Q13-137	AG-63-Z	BSK-70-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	1/2		BTS-22K	Oscillator Grid
R3	330Ω	1/2		BTS-330	IF Cathode
R4	3.3Meg	1/2		BTS-3.3Meg	AVC Network
R5	47KΩ	1/2		BTS-47K	Diode RF Filter
R6	2.2Meg	1/2		BTS-2.2Meg	AF Grid
R7	470KΩ	1/2		BTS-470K	AF Plate
R8	470KΩ	1/2		BTS-470K	Output Grid
R9	150Ω	1/2		BTS-150	Output Cathode
R10	1000Ω	1		BTA-1000	Filter
R11	33Ω	1/2			Surge Limiter
R12	33Ω	1/2			Rectifier Ballast
R13	220KΩ	1/2		BTS-220K	Line Isolation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		KNIGHT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.3K	3.2Ω	160Ω Tap ④ 45Ω	.5Ω	Part of SPK-19	A-3330 ①	A-3031 ①	RO-3 ①	① Bend mtg. tab down, and file out slots, mount on orig. bracket.

SPEAKER

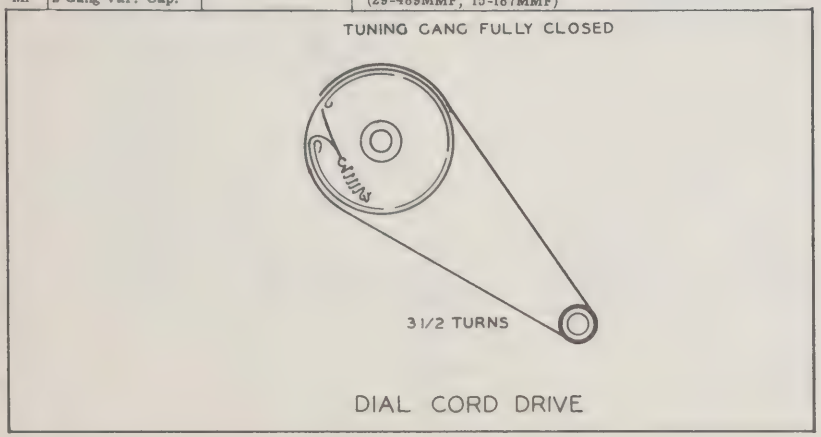
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	KNIGHT PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.2Ω	SPK.-19	ST-113 Mod. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP1B	4"	9/16"				

COILS (RF-IF)

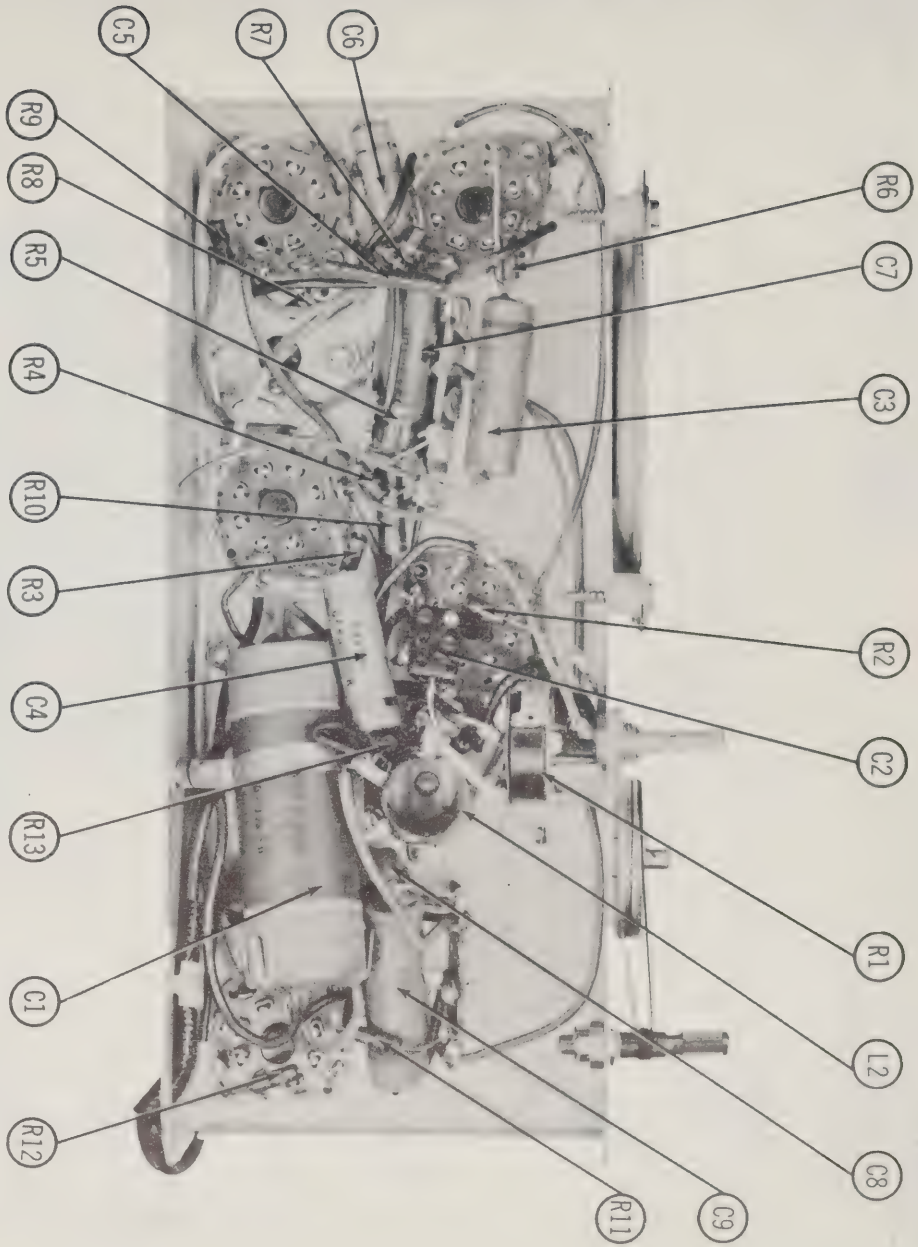
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	KNIGHT PART No.	MERIT PART No.	
L1	Loop Ant.	3.1Ω				
L2	Osc. Coil	6.5Ω				Tap at .6Ω
L3	Input IF	22Ω	22Ω			
L4	Output IF	22Ω	22Ω			

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	2 Gang Var. Cap.		(29-489MMF, 15-187MMF)



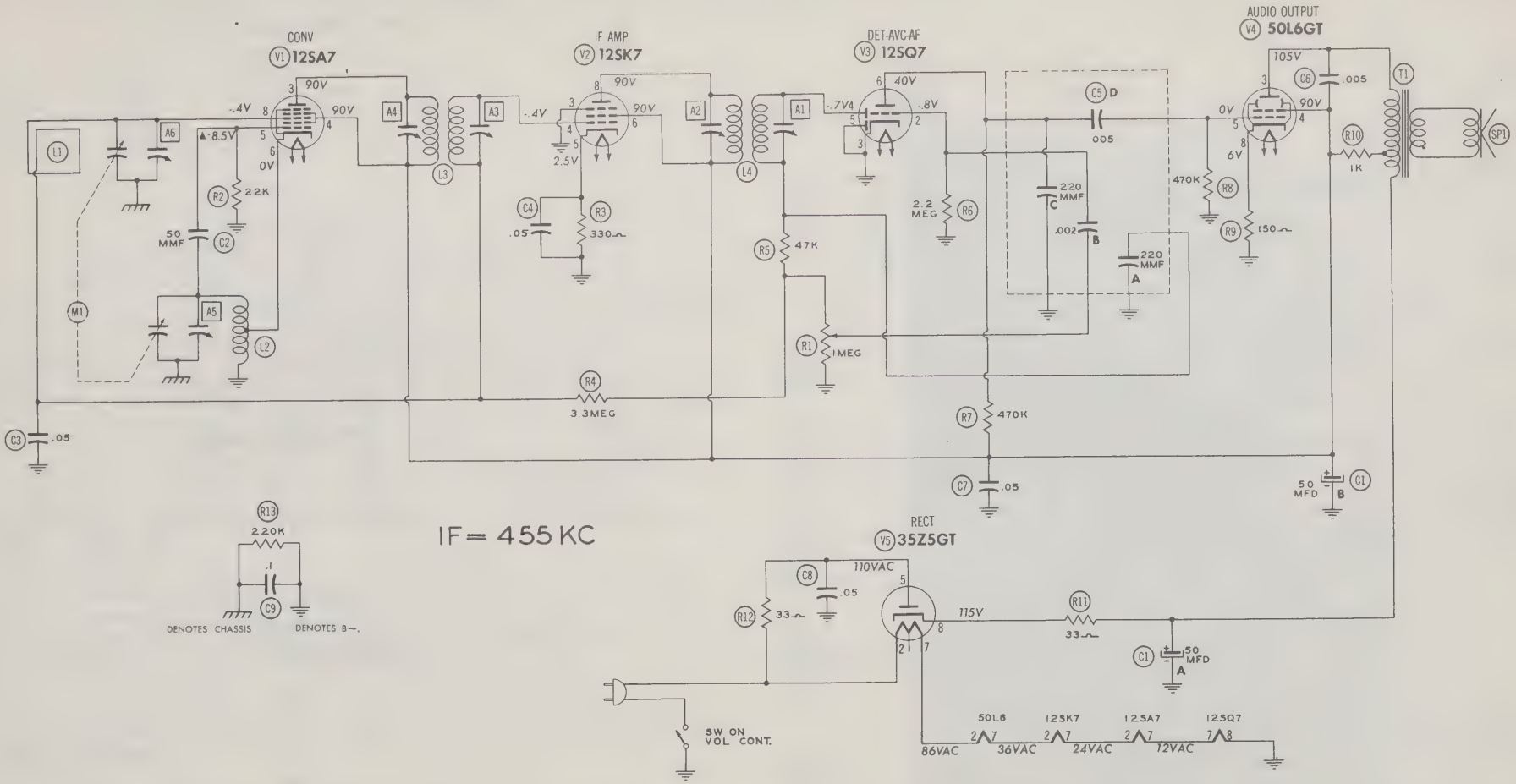
CHASSIS—BOTTOM VIEW



KNIGHT MODEL 5J705

KNIGHT MODEL 5J705

SET 174 FOLDER 8



IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	INF	24Ω	†1KΩ	†1KΩ	22KΩ	.6Ω	12Ω	4.3Meg
V 2	12SK7GT	INF	36Ω	0Ω	4.3Meg	330Ω	†1KΩ	24Ω	†1KΩ
V 3	12SQ7GT	INF	2.2Meg	0Ω	1Meg	INF	†470KΩ	12Ω	0Ω
V 4	50L6GT	INF	86Ω	†190Ω	†1KΩ	470KΩ	0Ω	24Ω	150Ω
V 5	35Z5GT	INF	121Ω	103Ω	INF	154Ω	INF	86Ω	50KΩ

† MEASURED FROM PIN 8 OF V5.
• TAKEN WITH VACUUM TUBE VOLTMETER

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

MOTOROLA
MODELS 14P2, 14P2U (Ch. TS-275)

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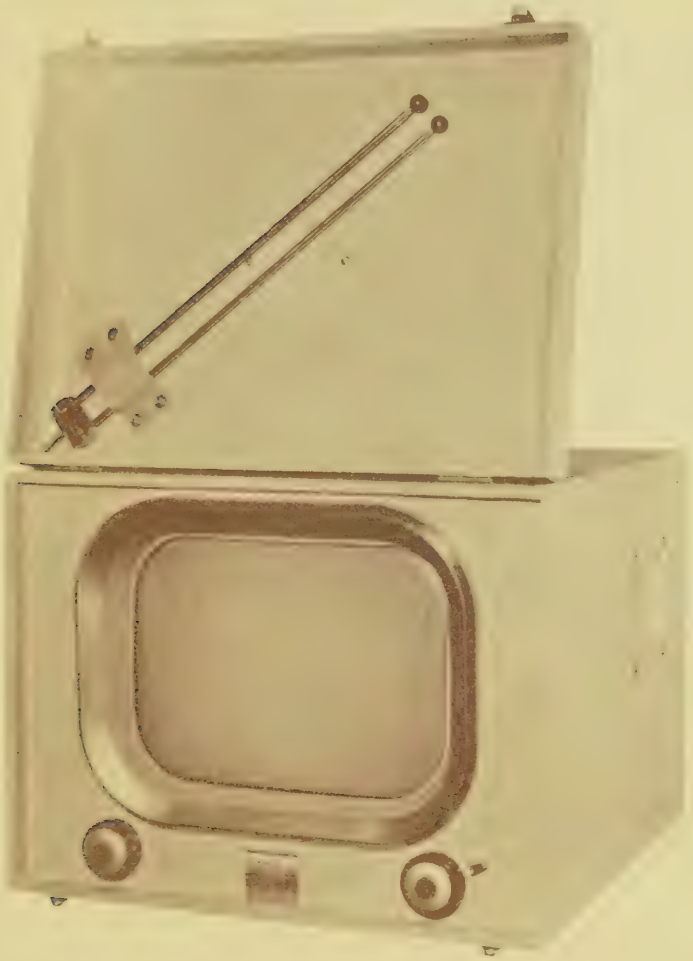

MODEL 14P2U

MOTOROLA
MODELS 14P2, 14P2U (Ch. TS-275)

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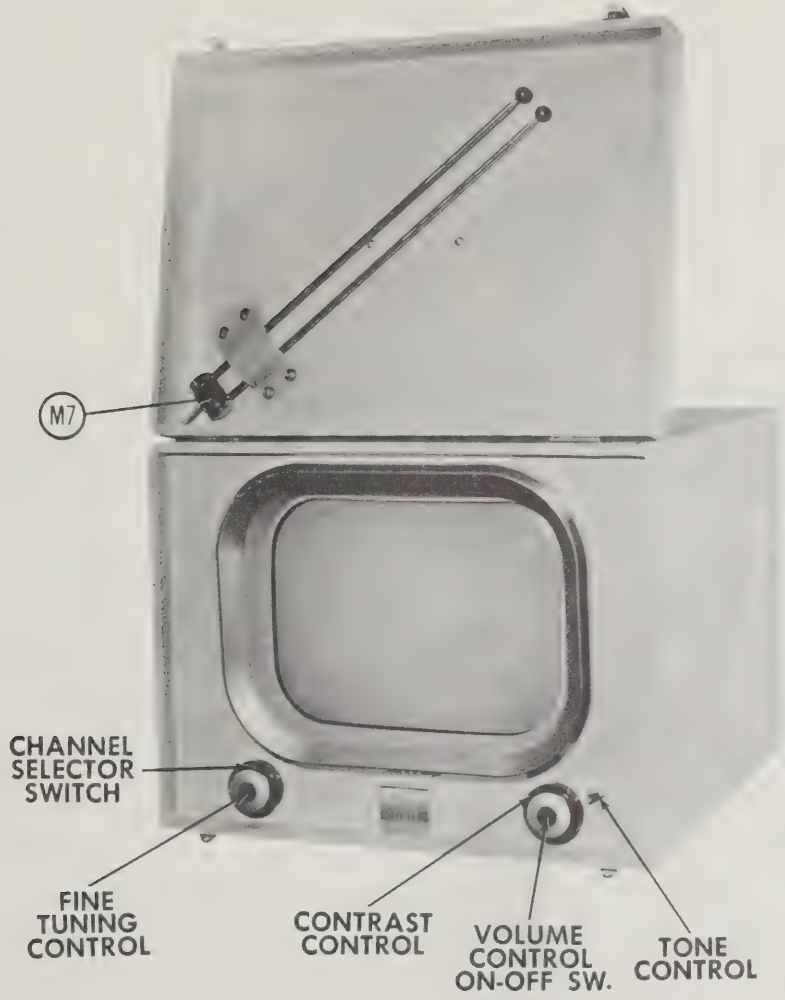
DATE 7-52 SET 174 FOLDER 9

MOTOROLA
MODELS 14P2, 14P2U (Ch. TS-275)



MOTOROLA
MODELS 14P2, 14P2U (Ch. TS-275)

Motorola 14P2U

TRADE NAME	Motorola Models 14P2, 14P2U (Ch. TS-275)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC - 60 Cycle RATING 1.26 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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Resistance Measurements 8
Schematic 2
Tube Placement Charts 5

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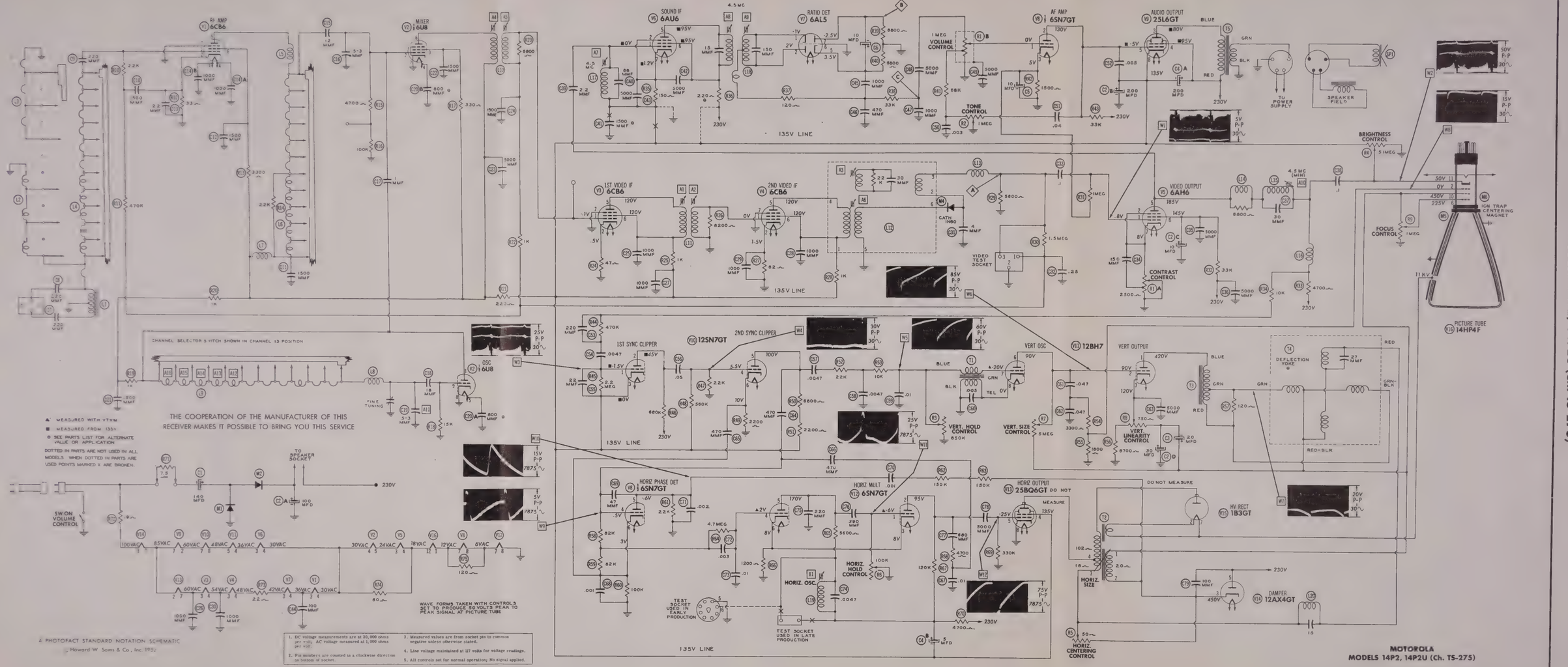
RF AMP 6CB6
MIXER 6U8
OSC 6U8
SOUND IF 6AU6
RATIO DET 6AL5
AF AMP 6SN7GT
AUDIO OUTPUT 25L6GT
1ST VIDEO IF 6CB6
2ND VIDEO IF 6CB6
VIDEO OUTPUT 6AH6
1ST SYNC CLIPPER
2ND SYNC CLIPPER 12SN7GT
VERT OSC
VERT OUTPUT 12BH7
HORIZ PHASE DET 6SN7GT
HORIZ MULT 6SN7GT
HORIZ OUTPUT 25BQ6GT
HV RECT 1B3GT
DAMPER 12AX4GT
PICTURE TUBE 16HP4F
135V LINE
VOLUME CONTROL
TONE CONTROL
BRIGHTNESS CONTROL
FOCUS CONTROL
CONTRAST CONTROL
VERT. HOLD CONTROL
VERT. SIZE CONTROL
VERT LINEARITY CONTROL
HORIZ. HOLD CONTROL
HORIZ. OSC
HORIZ. SIZE
HORIZ. CENTERING CONTROL
SPEAKER FIELD
TO POWER SUPPLY
DEFLECTION YOKE
ION TRAP CENTERING MAGNET
VIDEO TEST SOCKET
TEST SOCKET USED IN EARLY PRODUCTION
TEST SOCKET USED IN LATE PRODUCTION
TO SPEAKER SOCKET
SW ON VOLUME CONTROL
FINE TUNING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
MEASURED WITH VTVM
MEASURED FROM 135V
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
DO NOT MEASURE
100VAC 85VAC 60VAC 48VAC 36VAC 30VAC
30VAC 24VAC 18VAC 12VAC 6VAC
60VAC 54VAC 48VAC 42VAC 36VAC 30VAC
1. DC voltage measurements are at 20,000 ohms per volt; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.

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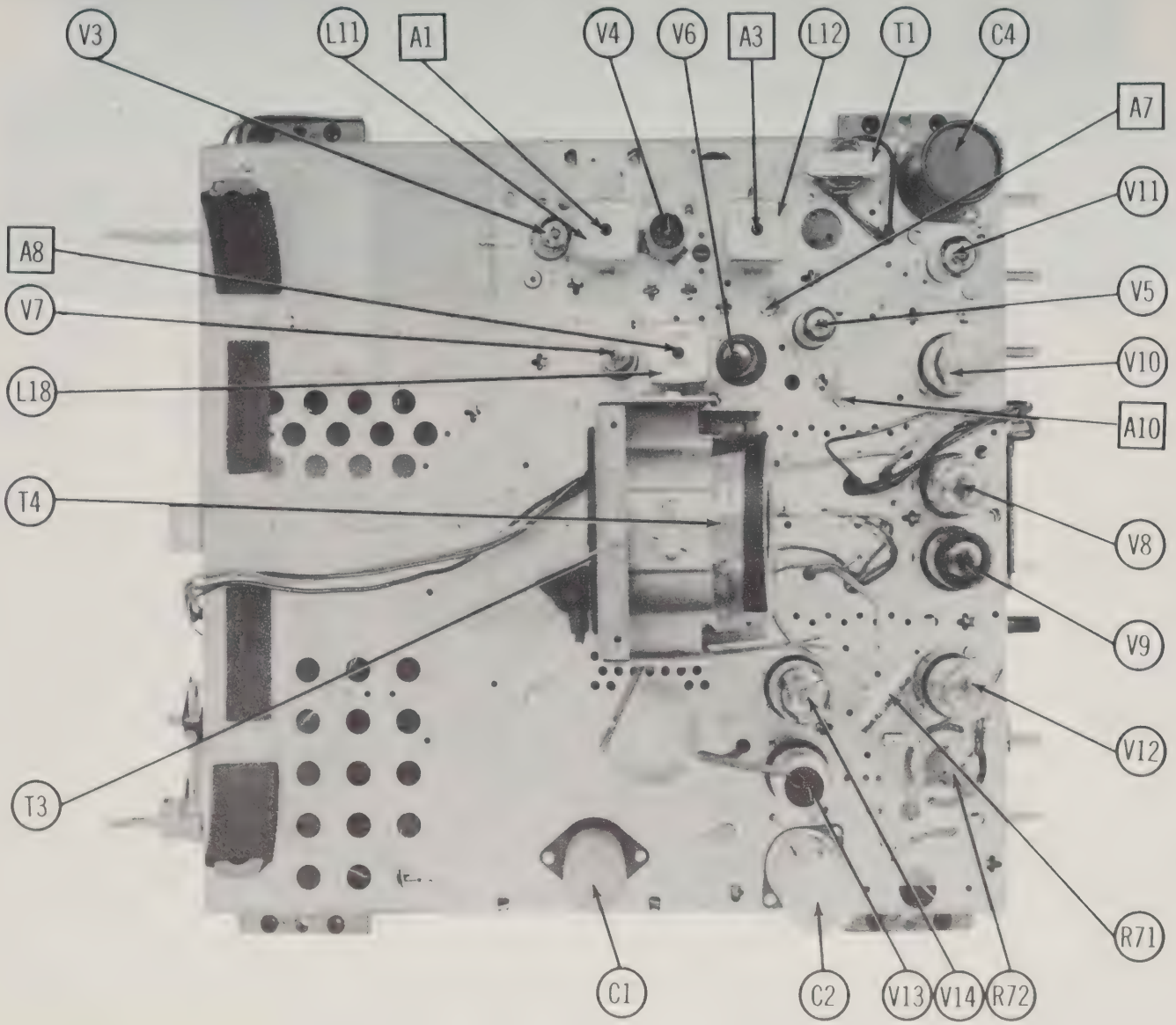
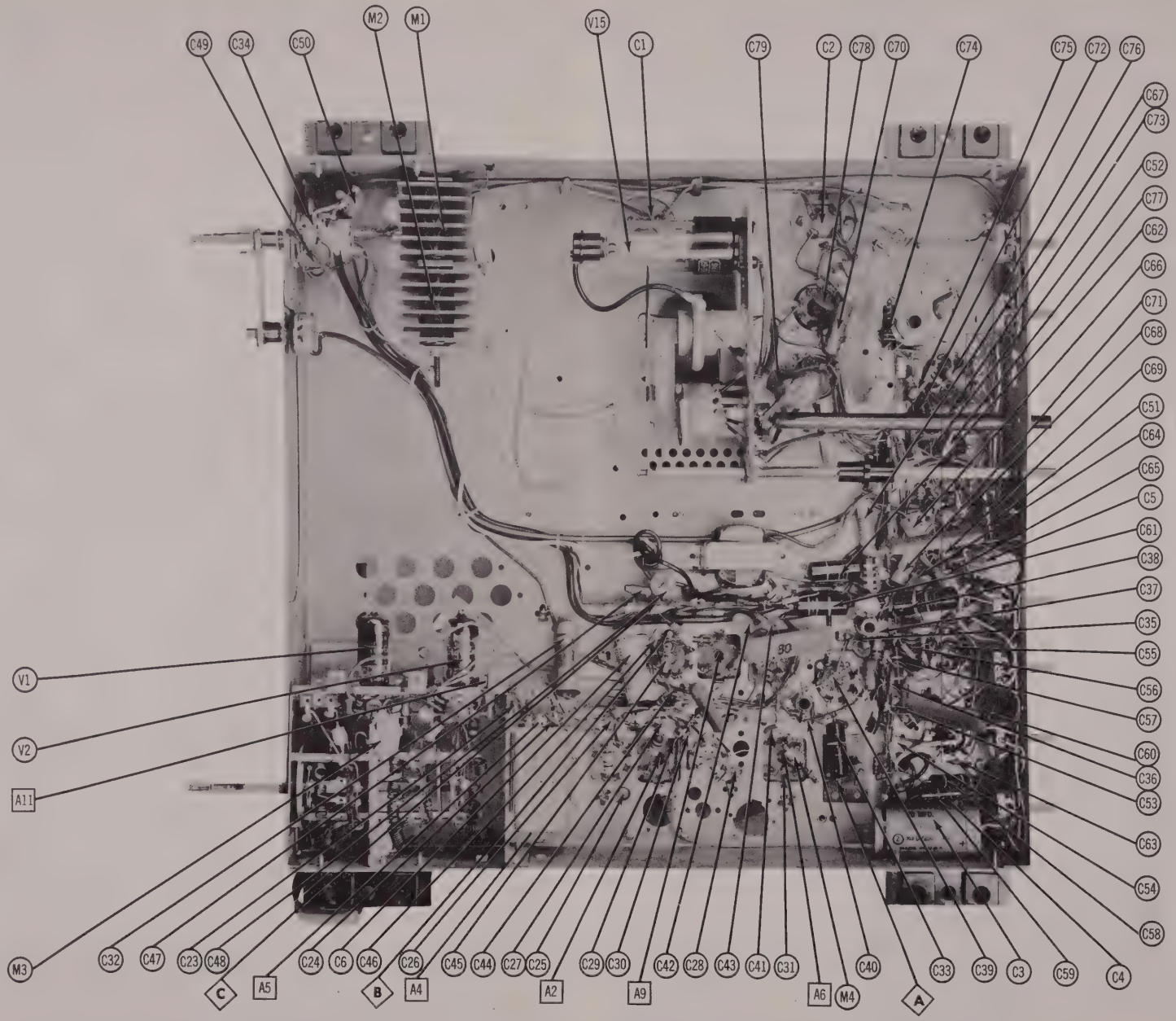
MOTOROLA
MODELS 14P2, 14P2U (Ch. TS-275)

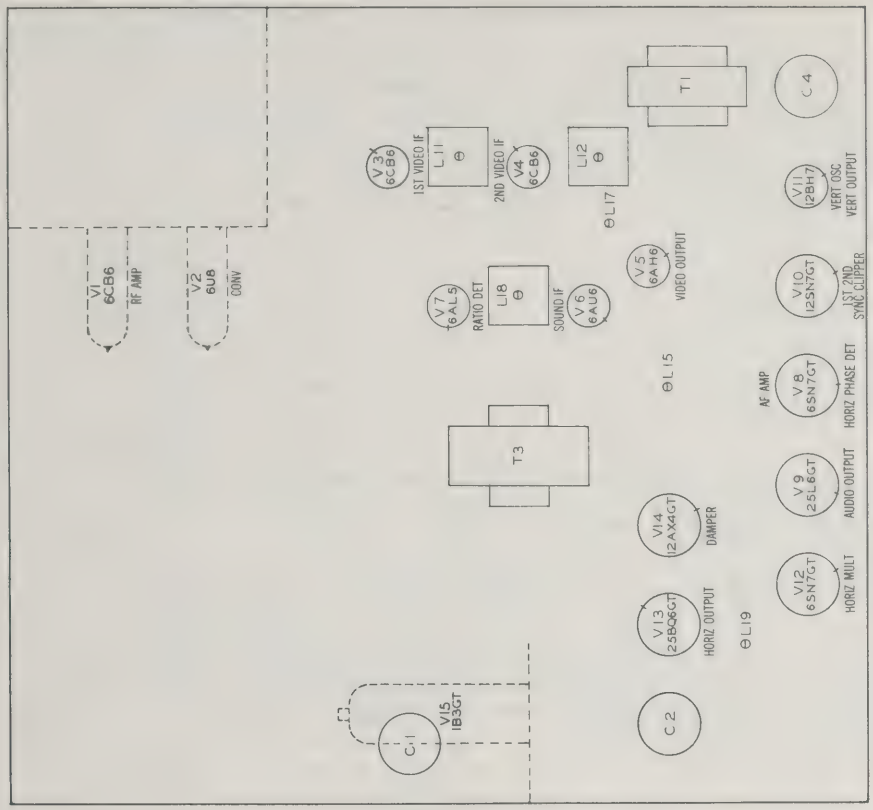
MOTOROLA
MODELS 14P2, 14P2U (Ch. TS-275)



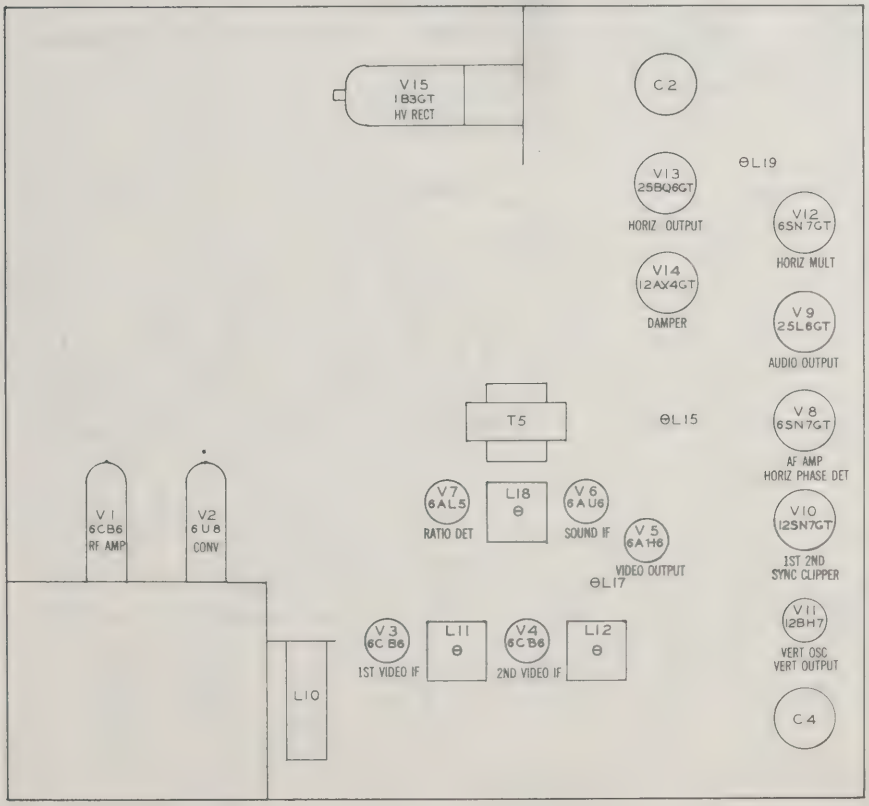
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove the horizontal output tube V13 and connect an 80 ohm, 10 watt resistor between terminals 2 and 7 of the socket, or replace with a similar tube which has all pins clipped off except pin 2 and 7. This will eliminate the high voltage shock hazard and reduce scope interference during alignment. Use an isolation transformer to protect the test pattern.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery through 47KΩ to pin 1 of the video test socket. Connect the positive lead to chassis. Connect an 820Ω damping resistor across the primary (terminals 1 and 4) of L12.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6, (V3). Low side to chassis.	24.6MC (10MC swp.)	24.75MC	Any non interfering channel.	Vert. amp. thru 47KΩ to Point (A). Low side to chassis.	A1, A2	Adjust for response curve as per fig. 1 with 24.75MC at center. (If curve is unstable or distorted, disable the local oscillator by a short across the oscillator inductance, position 2 to position 13 on the band switch).
2.	"	"	"	21.9MC	"	"	A3	Adjust for maximum attenuation at 21.9MC point on response curve as in fig. 1.
3.	"	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	"	24.75MC	"	"	A4, A5	Adjust for response curve as per fig. 2 with 24.75MC at center.
4.	"	"	"	22.9MC 26.4MC	"	"	A6	Remove the 820Ω damping resistor and adjust A6 for the response curve of fig. 3 with markers within limits as shown.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set contrast control to maximum clockwise position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A7, A8	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point (C). Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to Point (A). Low side to chassis.	4.5MC (450KC swp)	4.5MC	Any	Vert. amp. to Point (B). Low side to chassis.	A7, A8	Disconnect stabilizor capacitor C6. Adjust for maximum amplitude and symmetry as per fig. 4.
6.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A9	Reconnect stabilizor capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 5. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7	.001MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector (fig. 6) to pin 11 of picture tube. Common to chassis.	A10	Adjust for MINIMUM deflection.

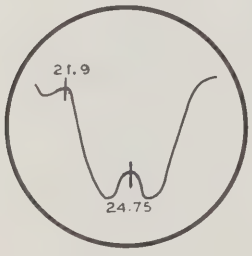


FIG. 1

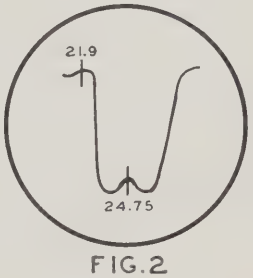


FIG. 2

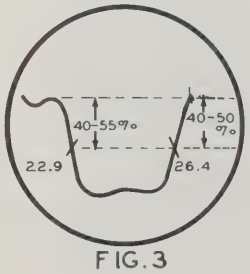


FIG. 3

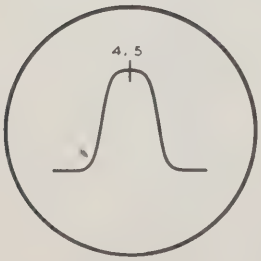


FIG. 4

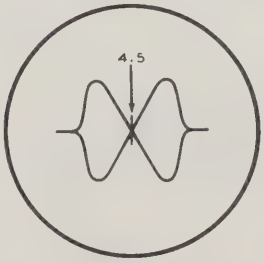


FIG. 5

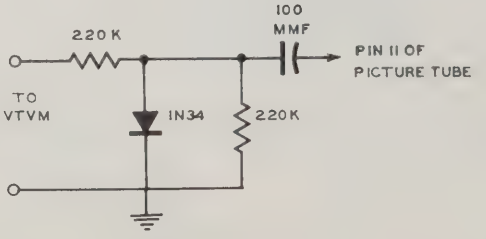


FIG. 6

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

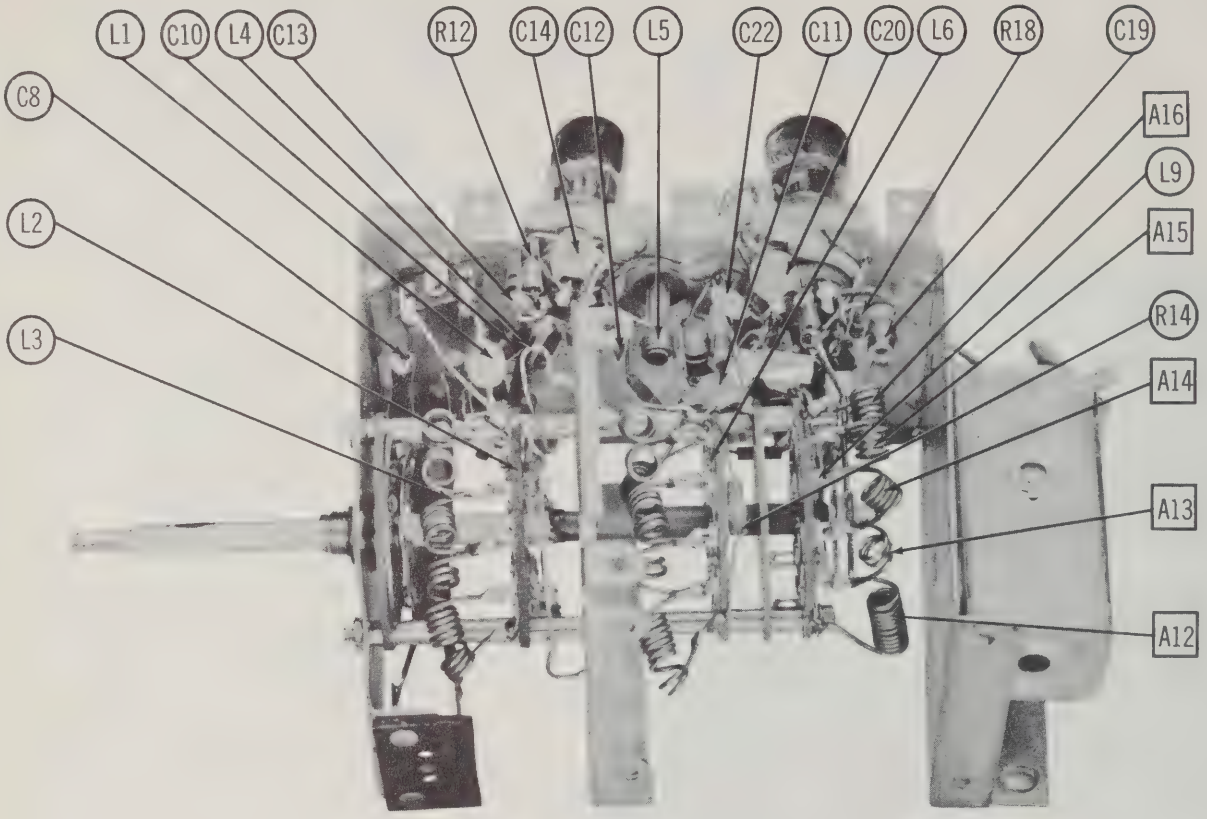
Remove the local oscillator shunt, if used previously, restoring the oscillator to normal operation.
Ground the AGC line by connecting pin 1 of the video test socket to chassis.
Set the fine tuning trimmer to mid capacity.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	197.75MC	10	Vert. amp. thru 47KΩ to point (A). Low side to chassis.	A11	Adjust to place the sound marker slightly higher in frequency than the 21.9MC trap dip. This allowance is necessary to compensate for the fact that the bottom shield is off the tuner. When the shield is replaced the sound marker will move down into the notch. Response curve should be similar to fig. 3.
9.	"	"	213MC (10MC Swp)	215.75MC	13	"	L8	Check all high band channels for sound marker slightly higher in frequency than 21.9 MC trap dip, with fine tuning trimmer within 30 degrees of mid-capacity. If more than 30 degree change in trimmer is necessary for correct marker placement adjust L8 by compressing or expanding coil turns for desired marker placement. Recheck A11 on channel 10 and readjust as in step 8 if necessary.
			207MC (10MC Swp)	209.75MC	12			
			201MC (10MC Swp)	203.75MC	11			
			189MC (10MC Swp)	191.75MC	9			
			183MC (10M C Swp)	185.75MC	8			
			177MC (10MC Swp)	179.75MC	7			
10.	"	"	85MC (10MC swp.)	87.75MC	6	"	A12	Set fine tuning trimmer 30 degrees from mid-capacity. Compress or expand A12 to place sound marker slightly higher in frequency than 21.9MC trap dip.
11	"	"	79MC (10MC swp.)	81.75MC	5	"	A13	Compress or expand to place sound marker slightly higher in frequency than 21.9MC trap dip with fine tuning trimmer not more than 15 degrees from position in Step 10.
			69MC (10MC swp.)	71.75MC	4		A14	
			63MC (10MC swp.)	65.75MC	3		A15	
			57MC (10MC swp.)	59.75MC	2		A16	

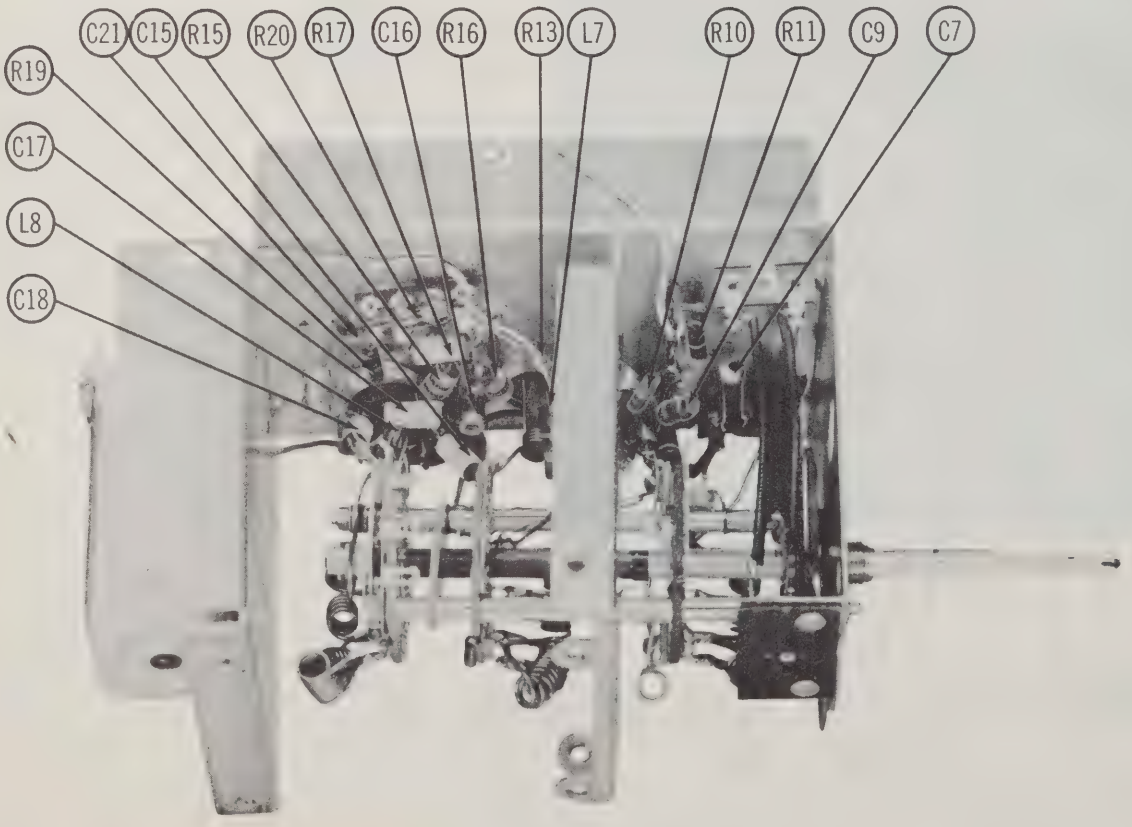
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2Meg	33Ω	11Ω	8.5Ω	■220Ω	■3.5KΩ	0Ω		
V 2	6U8	■2.2KΩ	100KΩ	■330KΩ	8.5Ω	6.7Ω	■220Ω	0Ω	0Ω	15KΩ
V 3	6CB6	1.5Meg	47Ω	27Ω	26Ω	■1KΩ	■1KΩ	0Ω		
V 4	6CB6	.2Ω	82Ω	26Ω	25Ω	■1KΩ	■1KΩ	0Ω		
V 5	6AH6	1Meg	400Ω	6.7Ω	4.9Ω	†4.8KΩ	†33KΩ	400Ω		
V 6	6AU6	■1Ω	■150Ω	11Ω	8.5Ω	†305Ω	†305Ω	■150Ω		
V 7	6AL5	INF	INF	14Ω	11Ω	6.8KΩ	0Ω	6.8KΩ		
V 8	6SN7GT	100KΩ	†33KΩ	1.5KΩ	265KΩ	22KΩ	100KΩ	3.4Ω	1.6Ω	
V 9	25L6GT	0Ω	20Ω	†295Ω	†85Ω	†33KΩ	180KΩ	25Ω	60KΩ	
V 10	12SN7GT	■2.2Meg	†680KΩ	■0Ω	22KΩ	■9KΩ	2.2KΩ	20Ω	16Ω	
V 11	12BH7	#800Ω	#2.8Meg	900Ω	11Ω	16Ω	#2.8Meg	580KΩ	53Ω	14Ω
V 12	6SN7GT	80KΩ	†125KΩ	1.2KΩ	4.9Meg	†10KΩ	1.2KΩ	1.6Ω	0Ω	
V 13	25BQ6GT	INF	25Ω	†125KΩ	■0Ω	330KΩ	22KΩ	27Ω	0Ω	TOP CAP #37Ω
V 14	12AX4GT	INF	#24Ω	100KΩ	INF	†85Ω	#300KΩ	25Ω	28Ω	
V 15	1B3GT	PINS 1 THRU 8 HAVE INF RESISTANCE								TOP CAP #139Ω
V 16	14HP4F	3.4Ω	1.8KΩ	PIN 6 250KΩ	PIN 10 #18Ω	PIN 11 360KΩ	PIN 12 4.9Ω			

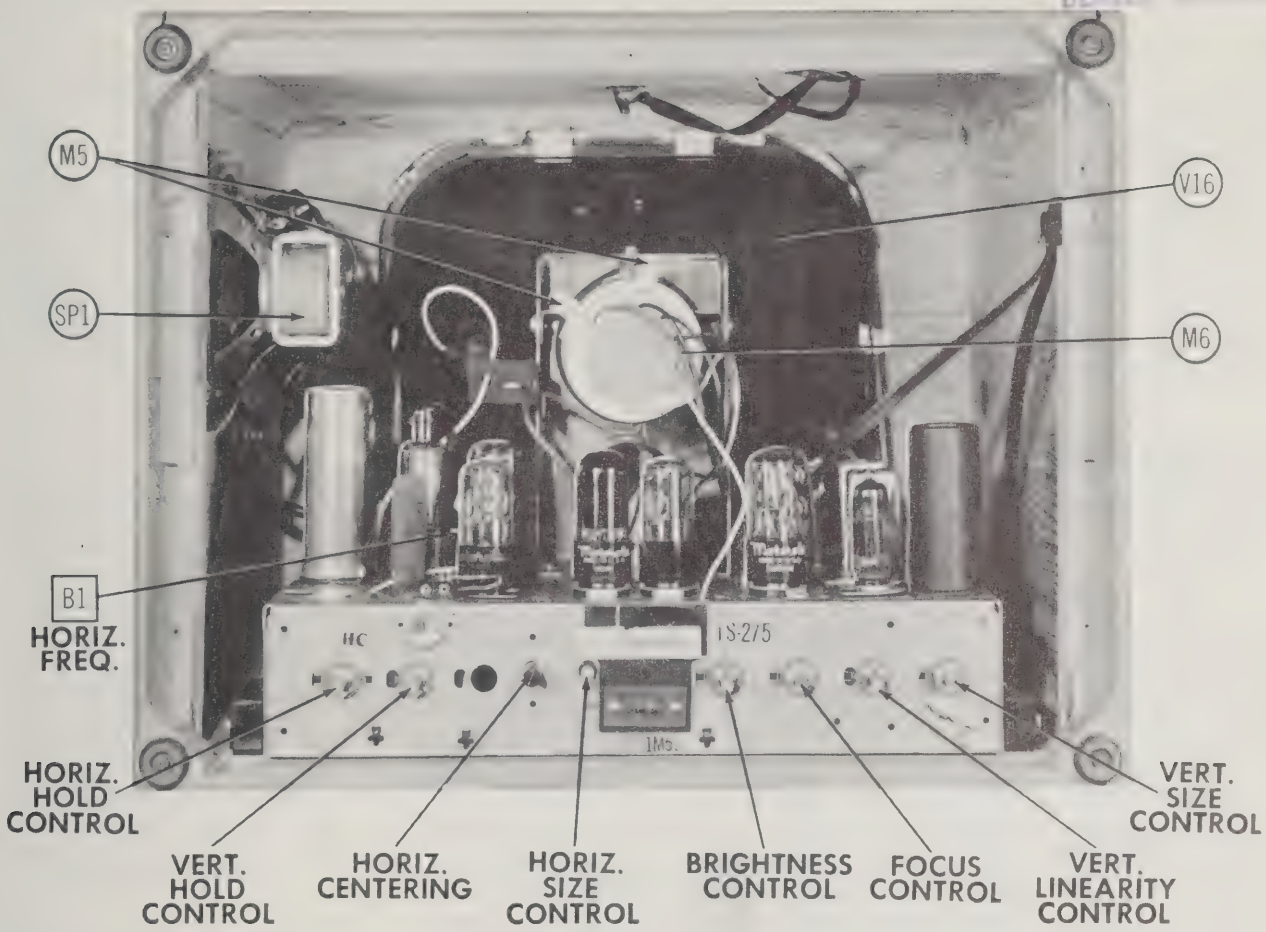
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM OUTPUT OF M1
■ MEASURED FROM 135VDC LINE
MEASURED FROM PIN 3 OF V14



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

The horizontal hold control should have a sync range of approximately 70 degrees. If the control is too critical, adjustment of the horizontal oscillator slug (B1) may be necessary.

Shunt the Horizontal oscillator coil, L19 with a .25MFD 400 volt capacitor. This can be done with the chassis in the cabinet by placing the capacitor across pins 5 and 6 of the test socket on the rear of the chassis, on sets which do not have this socket, across the 2 pin receptacle, also found on the rear of the chassis.

With the horizontal centering control move the picture to the left until the right edge of the raster is seen.

Adjust the horizontal hold so that about a quarter inch of blanking pulse appears at the right edge of the picture.

Remove the .25MFD capacitor and adjust B1 until the same amount of blanking pulse as noted above can be seen.

Adjust the horizontal size adjustment for a picture slightly wider than enough to fill the picture mask.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push on type control knobs from front panel.
2. Remove 2 screws. Remove antenna bracket.
3. Remove 5 wood screws, 1 metal screw. Remove rear cover.
4. Disconnect built-in antenna and speaker.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6CB6	6CB6	7CH	
V2	Converter	6U8	6U8	9-AE	
V3	1st. Video IF Amp.	6CB6	6CB6	7CH	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CH	
V5	Video Output	6AH6	6AH6	7BK	
V6	Sound IF Amp.	6AU6	6AU6	7BK	
V7	Ratio Detector	6AL5	6AL5	6BT	
V8	AF Amplifier - Horiz. Phase Det.	6SN7GT	6SN7GT	8BD	
V9	Audio Output	25L6GT	25L6GT	7AC	
V10	1st. & 2nd. Sync Clipper	12SN7GT	12SN7GT	8BD	
V11	Vert. Oscillator - Vert. Output	12BH7	12BH7	9A	
V12	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V13	Horiz. Output	25BQ6GT	25BQ6GT	6AM	
V14	Damper	12AX4GT	12AX4GT	4CG	
V15	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V16	14HP4F		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	140	150	23B484097	E3A130		UPE15015		TVL-1428	Voltage Doubler
C2A	100	300	23B712068	E4D491		UPT436		TVL-4561	▲ Filter
B	300	150							▲ Decoupling
C	10	300							■ Video Output Screen
D	30	150							Vert. Output Cathode
C3	30	450	23K710687	PRS450/20		BR2045A		TVA-1709	Vert. Output Decoupling
C4A	300	150	23B710941	E4B357		UPE1010I5		TVL-1431	▲ Filter
B	5	150				BR415		TVA-1402	▲ Horiz. MV Dec.
C5	10	50	23A90205	PRS50/10		BR105		TVA-1304	AF Amp. Cathode
C6	10	50	23A90205	PRS50/10		BR105		TVA-1304	Stabilizing Cap.
C7	220		21K77375	SI220	D6-221		GP2K-221	5GA-T22	RF Coupling
C8	220		21K77375	SI220	D6-221		GP2K-221	5GA-T22	RF Coupling
C9	220		21K400941	SI220	D6-221		GP2K-221	5GA-T22	RF Coupling
C10	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	AGC Filter
C11	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	RF Amp. Plate Dec.
C12	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	RF Amp. Screen Bypass
C13	22		21K400942	SI22	D6-220		GP1K-220	5GA-Q22	RF Amp. Cathode
C14A	1000		21K400937	BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	RF Amp. Fil. Bypass
B	1000								RF Amp. Fil. Bypass
C15	12		21K114073				N330K-120		RF Coupling
C16	.5-3		1X710954		829-3				Variable Trimmer
C17	1		21K114071		TCZ-1		NP0K-010		Osc. Coupling
C18	18		21K711246						Osc. Grid Cap.
C19	.5-3		1X710954		829-3				Variable Trimmer
C20A	800			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	Conv. Fil. Bypass †
B	800								Conv. Fil. Bypass †
C21	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	RF Bypass
C22	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	Mixer Screen Bypass
C23	5000		21A470789	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Mixer Plate Dec.
C24	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	AGC Filter
C25	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	1st. Video IF Dec.
C26	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	1st. Video IF Fil.
C27	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	RF Bypass
C28	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	2nd. Video IF Dec.
C29	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	2nd. Video IF Cathode
C30	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	2nd. Video IF Fil.
C31	4		21K38951				NP0K-040		Video Det. Filter
C32	.25	100	23K9810	P488-25		P22P25		4TM-P25	AGC Filter
C33	.1	300	23K490210	P288-1	DF-104	P22P1		2TM-P1	Video Coupling
C34	150		21R691948		TCN-150		N750L-151	5TCU-T15	Video Output Cathode
C35	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Video Output Screen
C36	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C37	30		21K470329						Fixed Trimmer
C38	.1	400	23K490236	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C39	2.2		21A478274		TCZ-2.2		NP0K-2R2 N470L-680		Sound IF Coupling Fixed Trimmer
C40	68		21R400928						
C41	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	Sound IF Grid Dec. *
C42	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Dec.
C43	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Cathode
C44	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-S1	Ratio Det. Fil. Bypass
C45	1000		21K780599	SI1000	D6-102	TM5D1	GP2L-102	5HK-S1	Diode Load Cap.
C46	470		21K400940	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	RF Bypass
C47	1000		21K780599	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	De-Emphasis
C48	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Audio Coupling
C49	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Volume Cont. Isolation
C50	.003	200	SR9820	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Tone Comp.
C51	.04	600	SK400028	P688-04		PTE6S4		6TM-S4	Tone Comp.
C52	.005	600	SR9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Grid
C53	220		21K77375	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	Sync Coupling
C54	.0047	400	SR490249	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Sync Coupling
C55	22		21K400942	SI22	D6-220	5R5Q25	GP1K-220	5GA-Q22	Sync Clipper Grid
C56	.05	400	SR9861	P488-05	DF-503	PTE4S5		4TM-S5	Sync Coupling
C57	.0047	400	SR490222	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Vert. Sync Coupling
C58	.0047	400	SR490222	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Vert. Integrator Net.
C59	.01	400	SR490226	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. Integrator Net.
C60	.005	400	SR9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Fixed Trimmer
C61	.047	400	SR490232	P488-047	DF-503	PTE4S47		4TM-S47	Vert. Discharge

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C62	.047	400	SR490232	P488-047	DF-503	PTE4S47		4TM-S47	Integrator Net.
C63	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Vert. Output Cathode
C64	470	500	21R6673	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sync. Coupling
C65	470	500	21R6673	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sync. Coupling
C66	470	500	21R6673	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Feedback
C67	.01	400	8R9858	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Voltage Divider
C68	.001	600	8R490243	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Voltage Divider
C69	47		21R114207	S147N750	TCN-47		N750K-470	5TCU-Q47	Horiz. Feedback
C70	.001	1000	8R490268	P1088-001		PTE16S1		MB-S1	Horiz. Feedback
C71	.002	600	8R9867	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Voltage Divider
C72	.003	400	8R9868	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Horiz. AFC Coupling
C73	.01	400	8R490226	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz. AFC Filter
C74	.0047	600	8R490249	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Fixed Trimmer
C75	220		21K77375	SI220	D6-221	5R5T25	GP2K-221	5GA-T22	Horiz. MV Plate
C76	390	500	21R114740	1469-0004		5R5T4		MS-34	Horiz. MV Feedback
C77	680	500	21R114781	1479-0007		2R5T7		MS-37	Horiz. Discharge
C78	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. Sweep Coupling
C79	100	3000	21K710935						Damper Plate

* Not used in all models

† Some models use 1000MMF in this application (Part #21K400937)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	2500Ω	½	18A702444	QJ-321 *	RTV-343		Contrast Control - Tapped ② 2000Ω - Panel
B	1Meg	½					Volume Control - Tapped ③ 300KΩ - Rear
R2A	1Meg	½	18A711999	QJ1-137	AG-61-S		Tone Control
B	Shaft		Not Req.	PQ	RS-2		Attach to R2A per instructions
R3A	850KΩ	½	18K711278	QJ1-137	AG-61-S		Vert. Hold Control - See Note 1
B	Shaft		Not Req.	Not Req.	RS-2		Attach to R3A per instructions
R4A	5.1Meg	½	18A702441		AG-85-S		Brightness Control - See Note 2
B	Shaft		Not Req.		RS-2		Attach to R4A per instructions
R5	50Ω	1	1X711613				Horiz. Centering Control - Wire Wound
R6A	100KΩ	½	18A702468	QJ1-128	AG-49-S	AB-40	Horiz. Hold Control - See Note 3
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R6A per instructions
R7A	5Meg	½	18A702443	QJ1-141	AG-85-S	AB-87	Vert. Size Control - See Note 4
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R7A per instructions
R8A	750Ω	½	18A702475		AG-8-S		Vert. Linearity Control
B	Shaft		Not Req.		RS-2		Attach to R8A per instructions
R9A	1Meg	½	18A711325	QJ1-137	AG-61-S	AB-69	Focus Control
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R9A per instructions

Note 1. Add a 350KΩ Resistor in series with clockwise terminal and ground

Note 2. Add a 100KΩ Resistor in series with clockwise terminal and ground

Note 3. Add a 40KΩ Resistor in series with clockwise terminal and Pin #1 of V12.

Note 4. Add a 1Meg Resistor in series with clockwise terminal and positive side of C3

* CONCENTRIKIT EQUIVALENT - Kit K-4, BASE ELEMENTS & SHAFTS B17-11IX & P1-128 (Panel)
B13-137X & R4-212 (Rear) & SWITCH 76-1

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R10	22KΩ	½	6R6397		RF Amp. Grid
R11	470KΩ 20%	½	6R6032	BTS-470K	AGC Network
R12	33Ω	½	6R2036		RF Amp. Cathode
R13	3300Ω 20%	½	6R6036	BTS-3300	RF Amp. Screen
R14	22KΩ	½	6R6397		RF Coil Shunt
R15	4700Ω 20%	½	6R6039	BTS-4700	Mixer Grid
R16	100KΩ	½	6R6075	BTS-100K	Mixer Grid
R17	330KΩ 20%	½	6R6014		Mixer Screen
R18	15KΩ 20%	½	6R2119	BTS-15K	Osc. Grid
R19	1000Ω 20%	½	6R6301	BTS-1000	Osc. Plate
R20	1000Ω 20%	½	6R6301	BTS-1000	Osc. Plate Decoupling
R21	220Ω 20%	½	6R3933	BTS-220	Decoupling
R22	1000Ω 20%	½	6R6301	BTS-1000	AGC Network
R23	6800Ω	2	6R6428		1st. Video IF Coil Shunt
R24	47Ω	½	6R2108		1st. Video IF Amp. Cathode
R25	1000Ω 20%	½	6R6301	BTS-1000	1st. Video IF Amp. Decoupling
R26	82000Ω	½	6R2004	BTS-8200	2nd. Video IF Coil Shunt
R27	82Ω	½	6R2035	BTS-82	2nd. Video IF Amp. Cathode
R28	1000Ω 20%	½	6R6301	BTS-1000	2nd. Video IF Amp. Decoupling
R29	5600Ω	½	6R6117	BTS-5600	Video Det. Load
R30	1.5Meg	½	6R6460	BTS-1.5Meg	AGC Network
R31	1Meg 20%	½	6R6046	BTS-1Meg	Video Output Grid
R32	33KΩ 20%	1	6R401012	BTA-33K	Video Output Screen
R33	4700Ω	2	6R5871	BTB-4700	Video Output Plate
R34	10KΩ 20%	½	6R6054	BTS-10K	Isolation
R35	150Ω 20%	½	6R3992	BTS-150	Sound IF Amp. Cathode
R36	220Ω 20%	½	6R3933	BTS-220	Sound IF Amp. Decoupling - See Note
R37	120Ω	½	6R5551	BTS-120	Balancing
R38	33KΩ	½	6R6Ω2	BTS-33K	De-emphasis
R39	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R40	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R41	68KΩ	½	6R6001	BTS-68K	Tone Compensation
R42	1500Ω 20%	½	6R6038	BTS-1500	AF Amp. Cathode
R43	33KΩ	½	6R6410	BTS-33K	AF Amp. Plate
R44	470KΩ 20%	½	6R6032	BTS-470K	Isolation
R45	2.2Meg 20%	½	6R3927	BTS-2.2Meg	1st. Sync Clipper Grid
R46	680KΩ	½	6R6475	BTS-680K	1st. Sync Clipper Plate
R47	22KΩ	½	6R6028	BTS-22K	2nd. Sync Clipper Grid
R48	560KΩ	½	6R5897	BTS-560K	Voltage Divider
R49	2200Ω 20%	½	6R6069	BTS-2200	2nd. Sync Clipper Cathode
R50	6800Ω	½	6R6428	BTS-6800	2nd. Sync Clipper Plate
R51	2200Ω	½	6R6069	BTS-2200	2nd. Sync Clipper Plate
R52	22KΩ	½	6R6028	BTS-22K	Integrator Network
R53	10KΩ 20%	½	6R6054	BTS-10K	Integrator Network
R54	3300Ω	½	6R5581	BTS-3300	Vert. Peaking
R55	1800Ω	½	6R2089	BTS-1800	Vert. Peaking
R56	8700Ω	3	17K710950		Vert. Output Cathode - Wire Wound
R57	120Ω	½	6R5551	BTS-120	Damping
R58	82KΩ	½	6R5644	BTS-82K	Horiz. Phase Det. Grid

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R59	82KΩ	½	6R5644	BTS-82K	Horiz. Phase Det. Grid
R60	100KΩ	½	6R6031	BTS-100K	Horiz. AFC Filter
R61	22KΩ	½	6R6397	BTS-22K	Horiz. Feedback
R62	150KΩ	1	6R410053	BTA-150K	Horiz. Feedback
R63	150KΩ	1	6R410053	BTA-150K	Horiz. Feedback
R64	4.7Meg 20%	½	6R2122	BTS-4.7Meg	Horiz. AFC Filter
R65	5600Ω	½	6R6117	BTS-5600	Horiz. MV Plate
R66	1200Ω	½	6R6393	BTS-1200	Horiz. MV Cathode
R67	120KΩ	½	6R5631	BTS-120K	Horiz. MV Plate
R68	4700Ω	½	6R6080	BTS-4700	Horiz. Peaking
R69	330KΩ	½	[illegible]	BTS-330K	Horiz. Output Grid
R70	4700Ω	½	6R6080	BTS-4700	Decoupling
R71	7.5Ω	5	1K711027		Surge Limiter - Wire Wound
R72	19Ω	10	17K711561	1 3/4A-20	Filament Dropping - Wire Wound
R73	22Ω	3	17K710128		Filament Dropping - Wire Wound
R74	80Ω	10	17K711224	1 3/4A-75	Filament Dropping - Wire Wound
R75	120Ω	10	17K712038	1 3/4A-125	Filament Dropping - Wire Wound

Note. Some Models use a 2200Ω Resistor in this application

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T1	53Ω	225Ω	25K702429				Vert. Osc. Trans.
			25K710730 ①				
T2	120Ω Tap ② 18Ω	20Ω SEC. 2 0Ω	24K711266				Horiz. Output Trans.
T3	730Ω Tap ③ 1Ω		25B702445		A-3081 ②		Vert. Output Trans.
T4A	31Ω		24C702655	DY-10	MDF-30		Horiz. Deflection Coils
B	3.5Ω		24C711217 ③				Vert. Deflection Coils
			24C703260 ③				
			24K702657 ③				
			24K703262 ③				
			24C702958 ③				
			24K711268 ③				

① Alternate Vert. Osc. Trans.
② Drill new mtg. holes.
③ Alternate deflection yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T5	2.2KΩ	3.6Ω	210Ω	.4Ω	25B710925	A-3876	A-2928		

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1A	85Ω	3.1Ω	50C70815 50C711061 ① 50C489002 ① 50C711976 ①		6E858	
	CONE DIA.	V. C. DIA.				
SP1B	6"	9/16"				

① Alternate EM Speaker

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
L1	Ant. Matching Coil	0Ω		24A790033			
L2	Ant. Primary Coils	0Ω		24K703079			Low Frequency
L3	Ant. Primary Coils	0Ω		24K703078			High Frequency
L4	Ant. Coils	0Ω		24K703003			Channels 2 thru 6
L5	RF Coil	0Ω		24C703076			Channel 13
L6	RF Coils	0Ω		24K703002			Channels 2 thru 6
L7	RF Choke	3Ω		24K792577		CLA	3.3 Microhenries
L8	Osc. Coil	0Ω		24K703077			Channel 13
L9	Osc. Coils	0Ω		24C703001			Channels 2 thru 6
L10	1st. Video IF	.2Ω	.2Ω	24B702983			
L11	2nd. Video IF	.3Ω	.2Ω	24B702982	TV-100		
L12	3rd. Video IF	.4Ω	.4Ω	24B711412			Includes trap, resistor, capacitor and RF choke
L13	RF Choke	2.6Ω		24B711413			
L14	Peaking Coil	17Ω		24K703319	*TV-188		Wound on 6.8K resistor
L15	4.5MC Trap	2.2Ω		1X792736	TV-151		
L16	Peaking Coil	9.5Ω		24K710140	TV-184		
L17	Sound IF	1Ω		1X790341	TV-151		
L18	Ratio Det.	2.8Ω	.3ΩCT	24B702543	TV-110		Tertiary Winding .25Ω
L19	Horiz. Osc.	46Ω		24K701558	TV-163		
L20	Horiz. Lin.	13.5Ω		24A710751			Wound on .15MFD Capacitor

* Parallel with 6.8K resistor

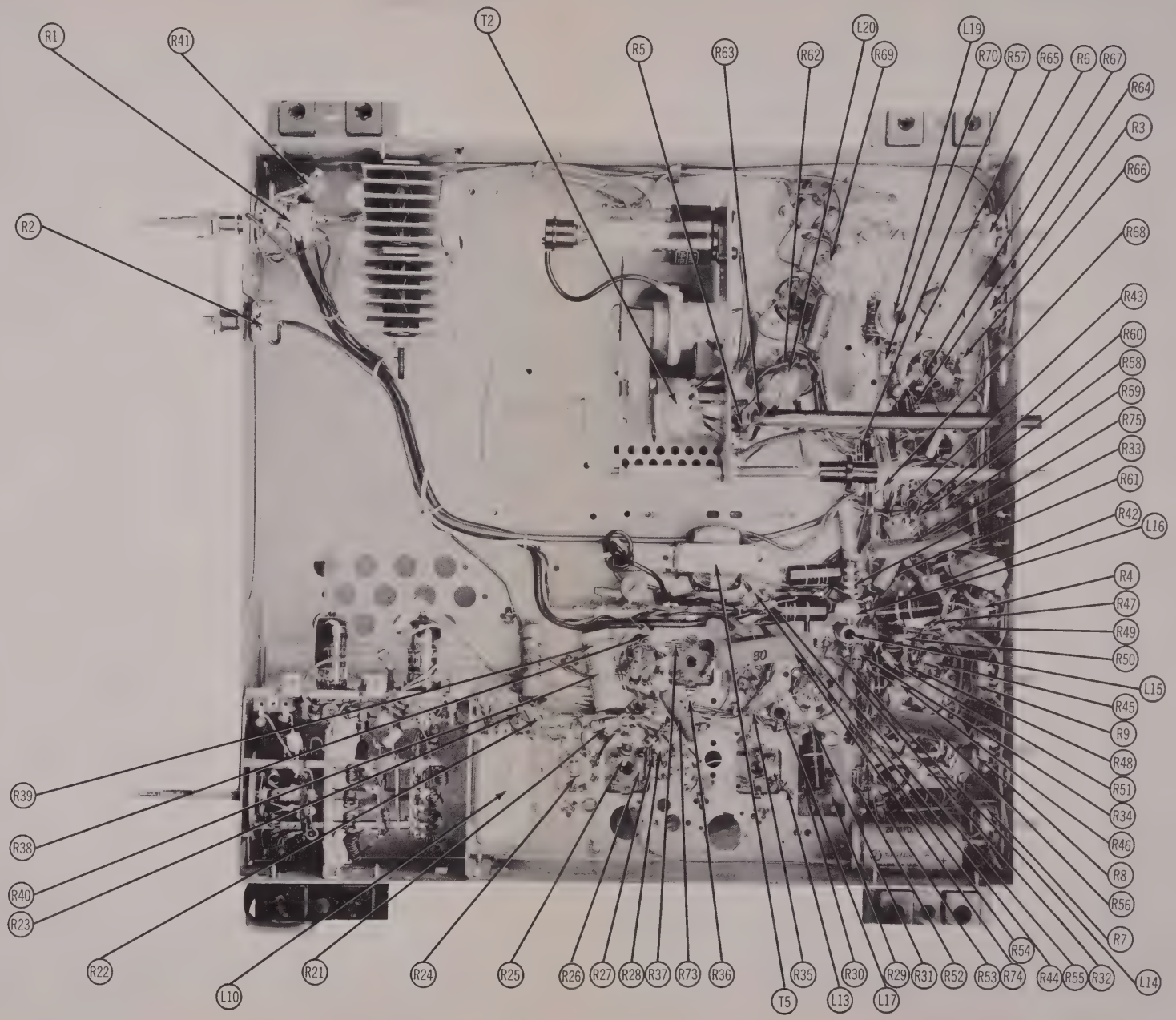
PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

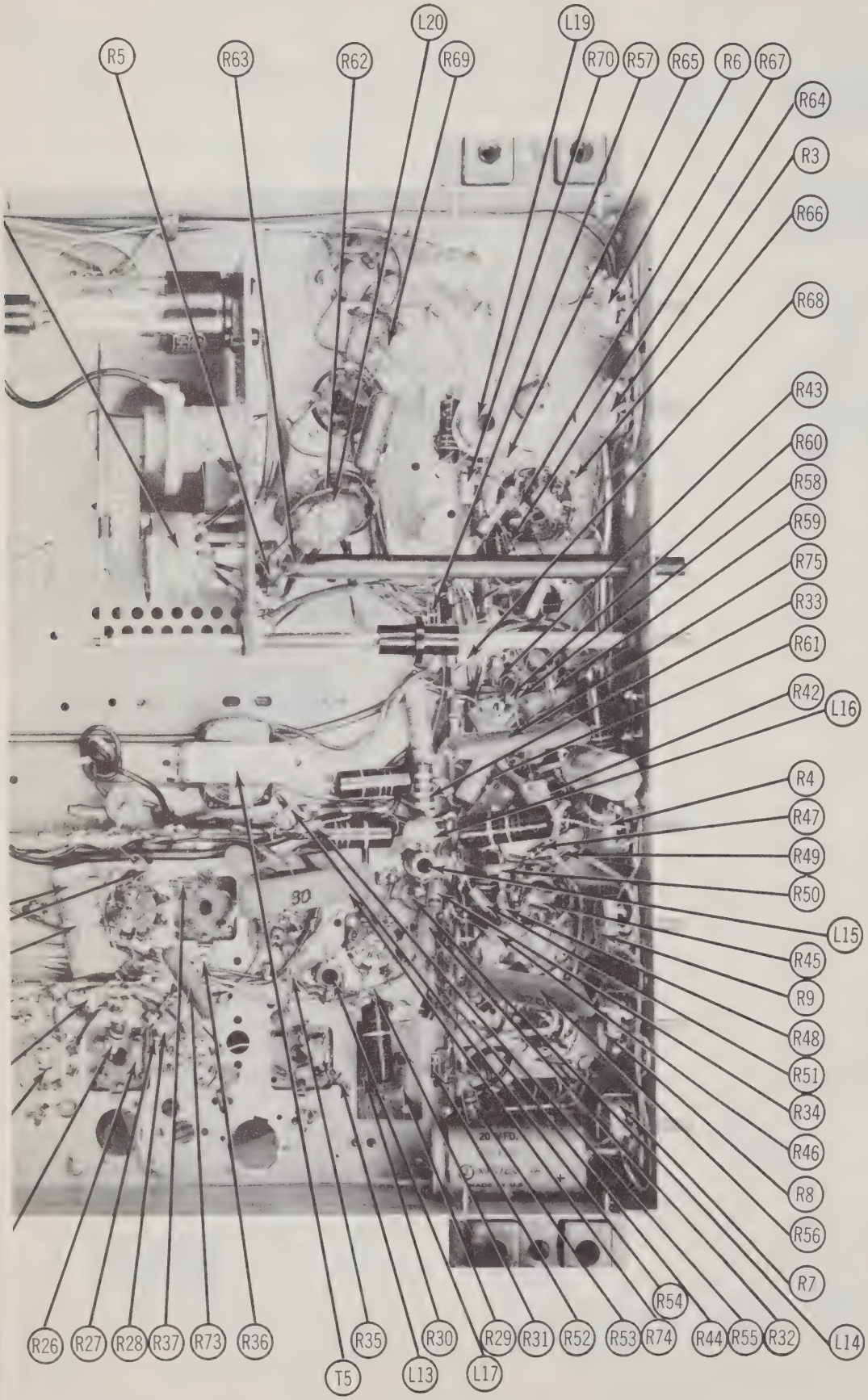
ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	
M1	.200A.	48B700555 or 48B703089	NH-5	6Q4	1028	
M2	.200A.	48B700555 or 48B703089	NH-5	6Q4	1028	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	RF Tuner	1X710744	TT-18 (Complete)
M4A	Crystal	48K712198	IN60
B	Crystal	48K712199	Alternate
C	Crystal	48K712200	Alternate
D	Crystal	48C711052	Alternate
E	Crystal	48K711077	Alternate
M5A	Centering Magnet	48A710701	
B	Centering Magnet	48B711241	Alternate
C	Centering Magnet	48B711243	Alternate
D	Centering Magnet	48A711264	Alternate
M6A	Ion Trap	24K711843	
B	Ion Trap	24K711842	Alternate
C	Ion Trap	24K711841	Alternate
M7	Antenna	1D711824	Complete (Model TA-78 Antenna)
	Knob	36C700733	Channel Selector
	Knob	36K700734	Contrast
	Knob	36C700732	Off/On Volume & Fine Tuning
	Knob	36A485457	Vert. & Horiz. Hold (On rear of chassis)



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



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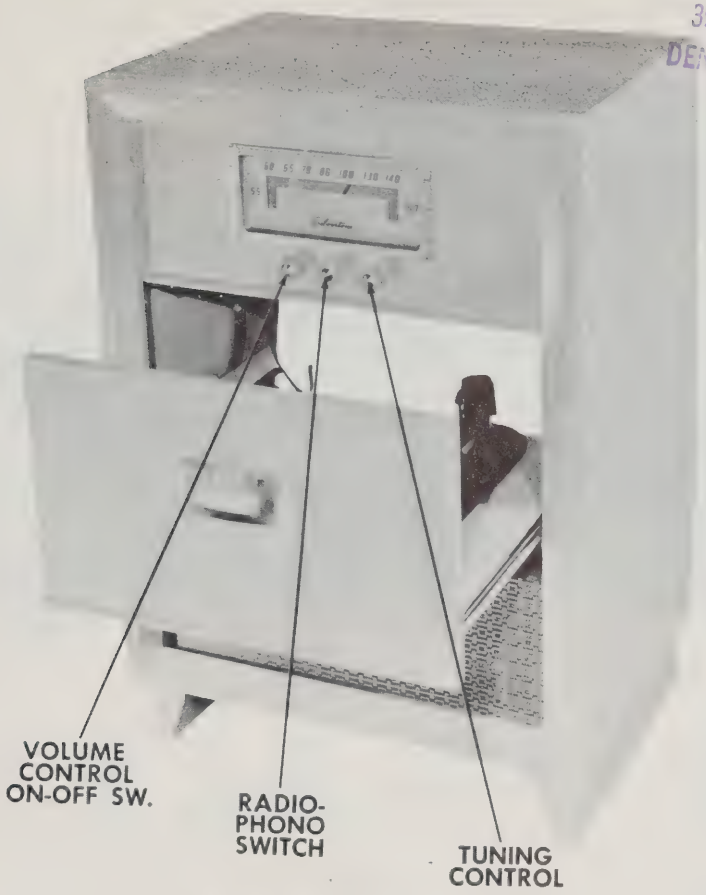
SILVERTONE
MODELS 1052, 1053 (Ch. 132.011)



SILVERTONE
MODELS 1052, 1053 (Ch. 132.011)

SILVERTONE MODEL 1053

TRADE NAME	Silvertone Models 1052, 1053 (Ch. 132.011)
SUPPLIER	Sears Roebuck & Co., Inc., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated AM Radio - Phono Combination Superheterodyne Receiver
TUBES (Six)	Types 12SK7GT RF Amp., 12SA7GT Conv. 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF Amp., 35L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles RATING .210 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 - 1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 8 (grid) of 12SA7 (V2). Low side to B-.	455 KC (400~ mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	50MMF	High side to external antenna connection. Low side to B-.	1400 KC	1400 KC	"	A5, A6, A7	Adjust for maximum output.

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT-SEE SIMILAR V-M MODEL 950-PHOTOFACT SET #107-FOLDER #13 OR RECORD CHANGER MANUAL CM-3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Silvertone PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	12SK7GT	12SK7GT	8N	
V2	Converter	12SA7GT	12SA7GT	8R	
V3	IF Amplifier	12SK7GT	12SK7GT	8N	
V4	Det-AVC-AF Amp.	12SQ7GT	12SQ7GT	8Q	
V5	Audio Output	35L6GT	35L6GT	7AC	
V6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	150	N24300	PRS150/40-40+40					Filter - Red
B	50	150		PRS150/50					Filter - Green
C	50	150							Filter - Yellow
C2	.05	200		P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C3	50	500		1468-00005	D6-500	5W5Q5	GP1K-500	1FM-45	Osc. Grid Cap.
C4	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	Diode RF Filter
C5	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Phono Isolation
C6	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C7	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	AF Amp. Plate Bypass
C8	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C9	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Output Plate
C10	.05	200		P288-05	DF-503	PJ2S5		2TM-S5	Tone Comp.
C11	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Line Filter
C12	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Silvertone PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	C22963	Q13-133	AG-60-Z	B-60-S	Volume Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	Not R	Not Req.	Attach to R1A per instructions

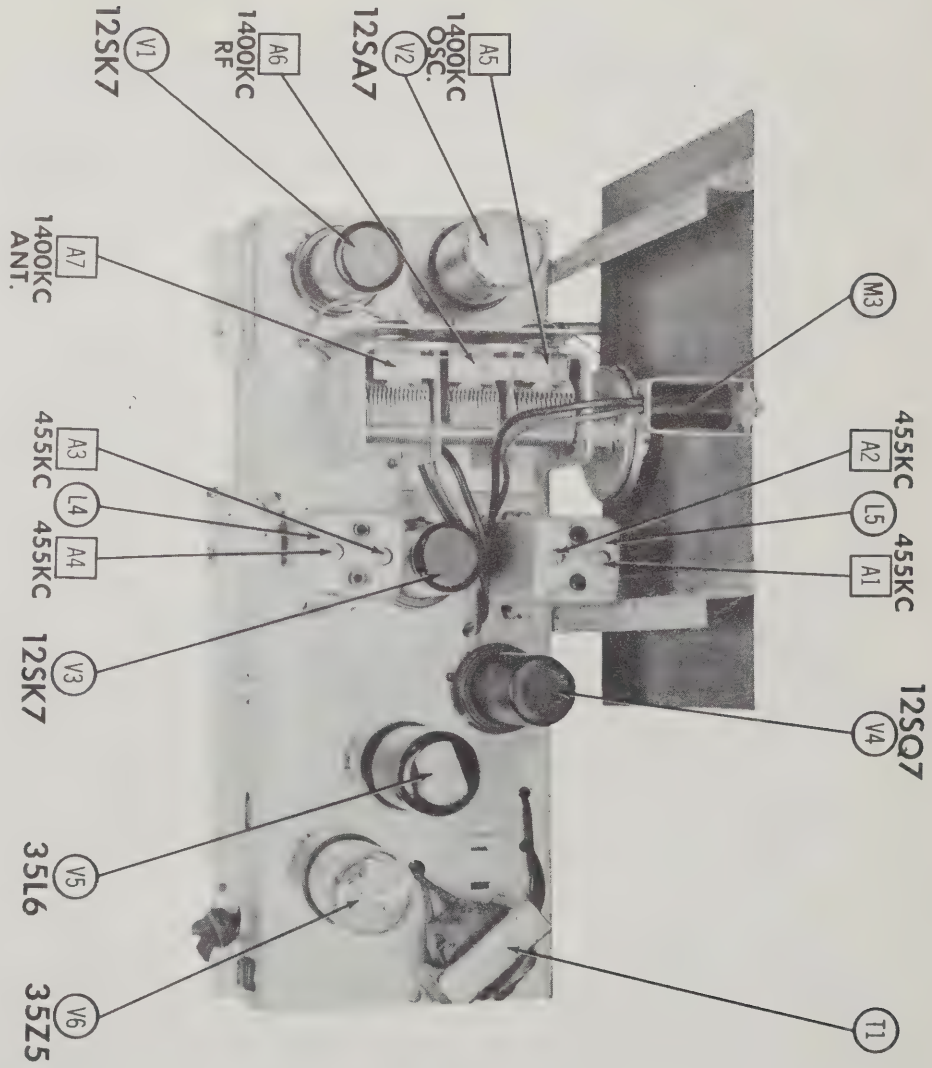
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Silvertone PART No.	IRC PART No.	IDENTIFICATION CODES
R2	1000Ω	½		BTS-1000	Converter Grid
R3	22KΩ	½			Osc. Grid
R4	6.8Meg	½		BTS-6.8Meg	AVC Network
R5	1Meg	½		BTS-1Meg	Diode Filter
R6	680Ω	½		BTS-680	Feedback Network
R7	3.3Meg	½		BTS-3.3Meg	AF Amp. Grid
R8	330KΩ	½		BTS-330K	AF Amp. Plate
R9	470KΩ	½		BTS-470K	Output Grid
R10	150Ω	½		BTS-150	Output Cathode
R11	2200Ω	½		BTS-2200	Tone Compensation
R12	1200Ω	2		BTB-1200	Filter
R13	120Ω	1		BW-1-120	Filter - Wire Wound
R14	15Ω	½			Surge Limiter
R15	150Ω	½		BTS-150	Pilot Light Shunt
R16	330KΩ	½		BTS-330K	Line Isolation.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Silvertone PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	3.5KΩ	3.8Ω	110Ω	.4Ω	N-23931-1	A-3856	A-2928	RO-302	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Silvertone PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.8Ω	N24817		57A1	
	CONE DIA.	V. C. DIA.				
SP1B	5" x 7"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Silvertone PART No.	MERIT PART No.	
L1	Loop Ant.	.2Ω	2Ω	N23159		
L2	RF Coil	.5Ω	4Ω	N23163-1	BC-382	
L3	Osc. Coil	.6Ω	6.5Ω	N23751-1	BC-381	
L4	Input IF	25Ω	25Ω	N23161-1	BC-368	
L5	Output IF	24Ω	24Ω	N23162-1	BC-371	

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA						REMARKS
	Silvertone PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		GC-AG-J	G-AG	WC36B	A56U	43	0-2 or S-2

ASTATIC, SHURE AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Silvertone PART No.	WALCO PART No.	JENSEN PART No.	
M2		W-3AGS or W-3AGA	S-642 or S-652	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Silvertone PART No.		
M3	Bayonet	6-8	.25	Brown	N19351		Type #47

MISCELLANEOUS

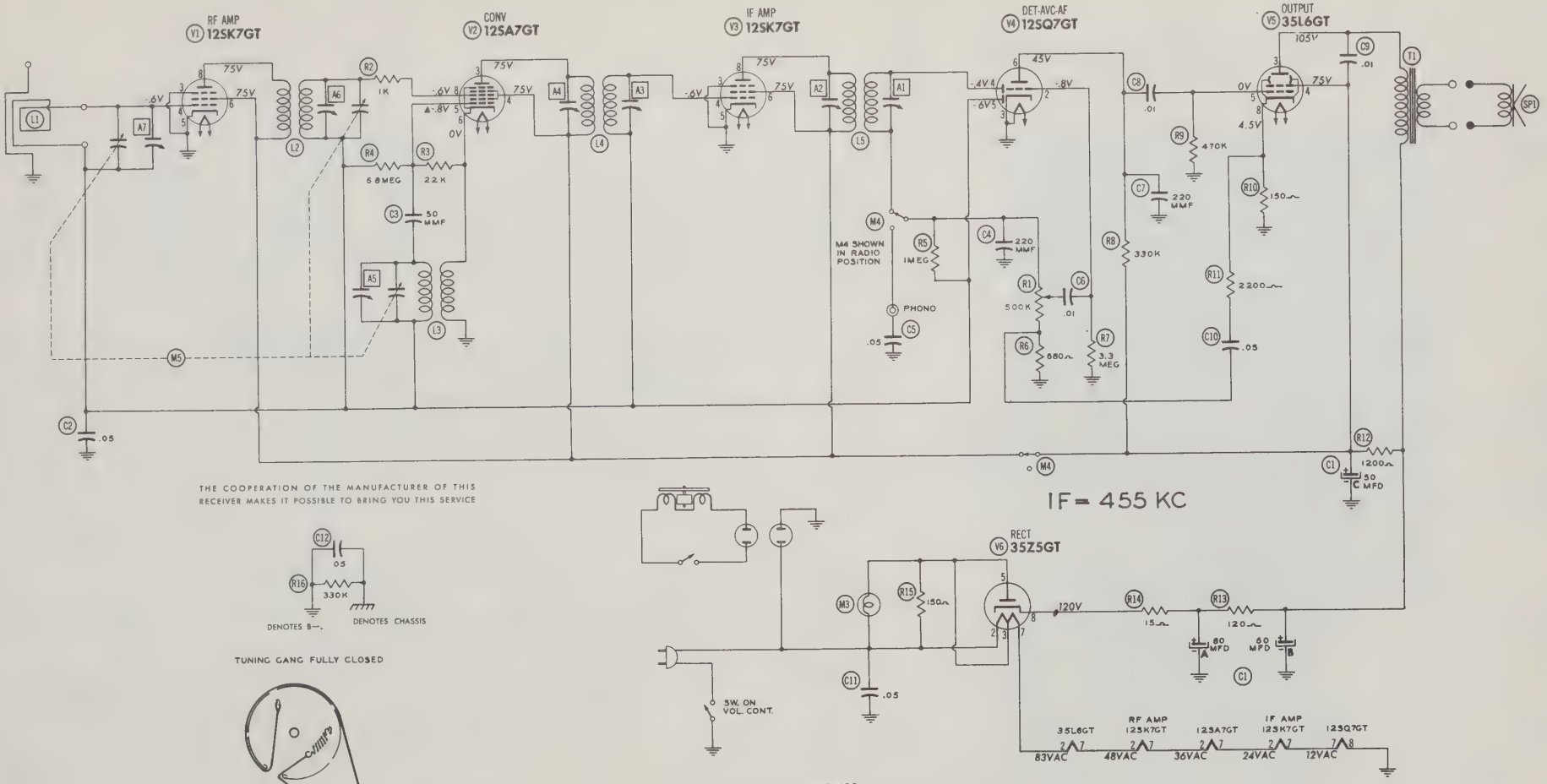
ITEM No.	PART NAME	Silvertone PART No.	NOTES
M4	Switch	N23486	Radio-Phono
M5	3 Gang Var. Cap.	N23743	(39-507MMF, 28-358MMF, 26-193MMF)
	Dial Scale	N25050	Mahogany
	Dial Scale	N25113	Blonde
	Knob	N22604-6A	On-Off Volume (Mahogany)
	Knob	N22604-7A	On-Off Volume (Blonde)
	Knob	N22604-6D	Radio-Phono Switch (Mahogany)
	Knob	N22604-7D	Radio-Phono Switch (Blonde)
	Knob	N22604-6C	Tuning (Mahogany)
	Knob	N22604-7C	Tuning (Blonde)

CHASSIS—BOTTOM VIEW

SET 174 FOLDER 10

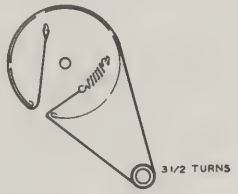
SILVERTONE MODEL 1052 (Ch. 132.011)

SILVERTONE MODEL 1052 (Ch. 132.011)



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

TUNING GANG FULLY CLOSED



DIAL CORD DRIVE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SK7	330KΩ	48Ω	0Ω	1.2Meg	0Ω	†1.3KΩ	36Ω	†1.3KΩ
V 2	12SA7	330KΩ	36Ω	†1.3KΩ	†1.2KΩ	22KΩ	.6Ω	24Ω	1.2Meg
V 3	12SK7	330KΩ	24Ω	0Ω	1.2Meg	0Ω	†1.3KΩ	12Ω	†1.3KΩ
V 4	12SQ7	330KΩ	3.3Meg	0Ω	500KΩ	1.2Meg	†330KΩ	12Ω	0Ω
V 5	35L6GT	INF	83Ω	†225Ω	†1.3KΩ	470KΩ	2.3KΩ	48Ω	150Ω
V 6	35Z5GT	INF	118Ω	100Ω	†15Ω	100Ω	†135Ω	83Ω	60KΩ

ALL MEASUREMENTS TAKEN IN "RADIO" POSITION
† MEASURED FROM PIN 8 OF V6
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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174-10

1. DC Voltage measurements are at 20,000 ohms per volt: AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

SONORA
MODELS 305, 323, 324, 325, 332

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DATE 7-52 SET 174 FOLDER 11

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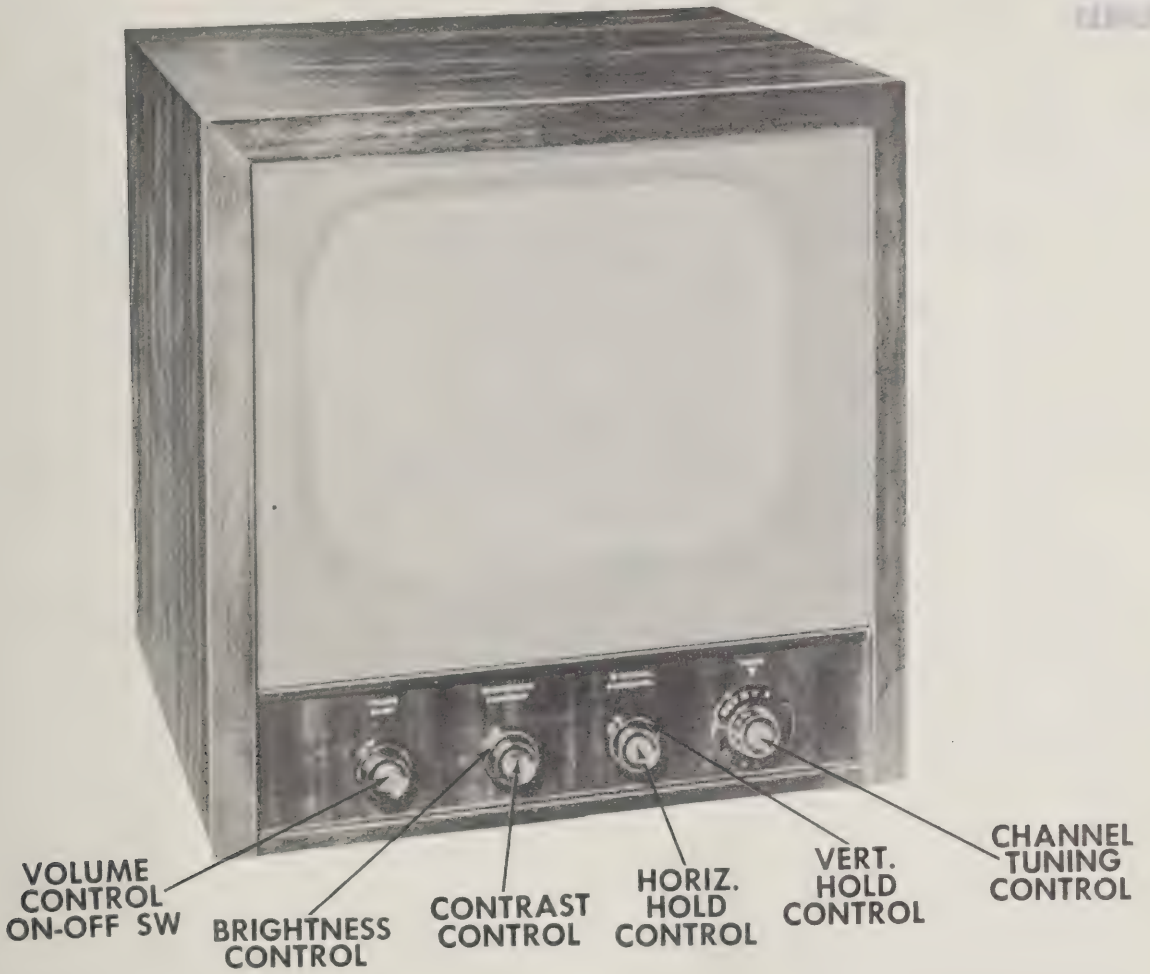
MODELS 305, 323, 324, 325, 332



SONORA
MODELS 305, 323, 324, 325, 332

SONORA MODEL 305

TRADE NAME	Sonora Models 305, 323, 324, 325, 332
MANUFACTURER	Sonora Radio & Television Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts-60 Cycle — RATING 1.82 Amp. @ 117 Volts AC.
TUNING RANGE—	Channels 2 thru 13 Continuous Tuning

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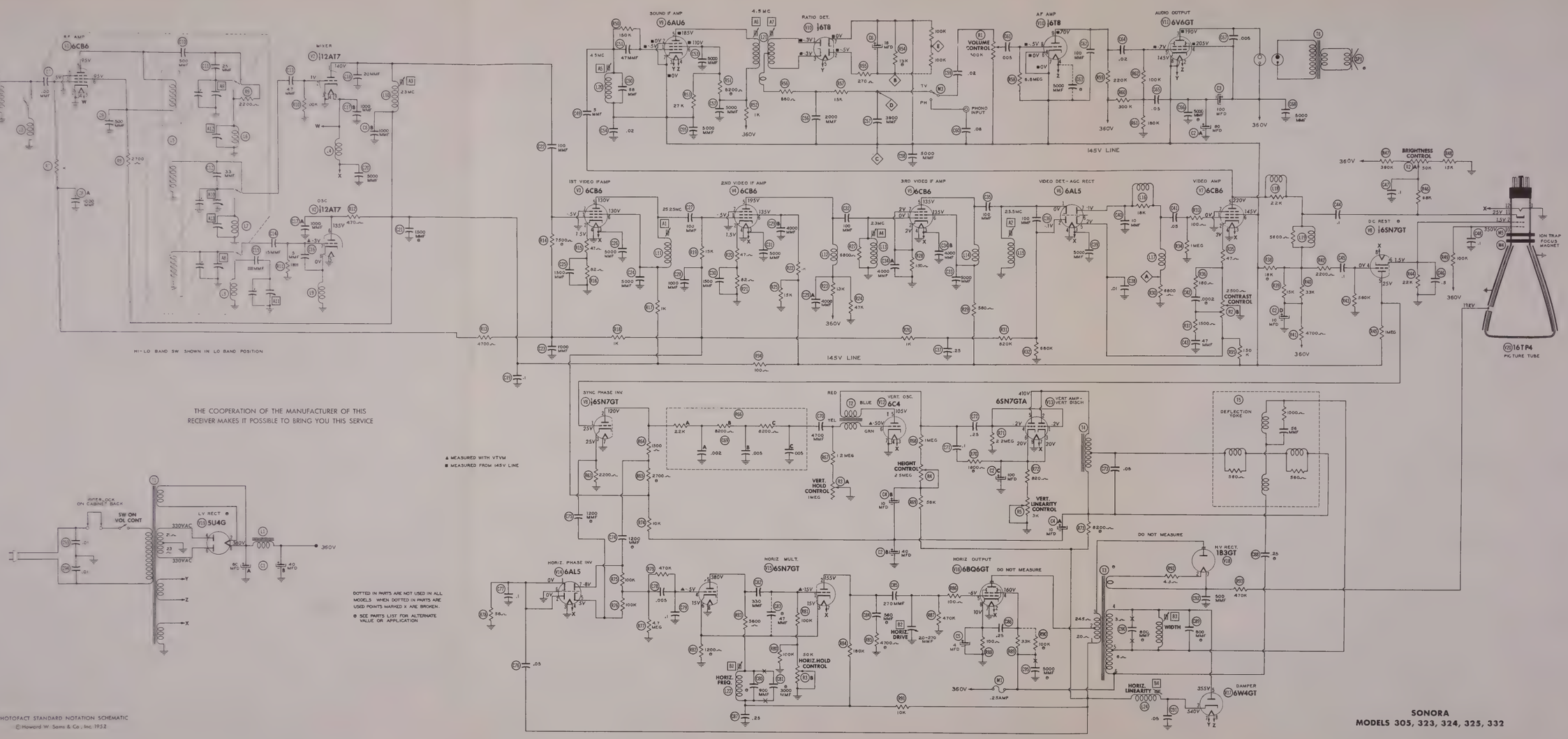
SONORA
MODELS 305, 323, 324, 325, 332
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
▲ MEASURED WITH VTVM
■ MEASURED FROM 145V LINE
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
⊘ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
HI-LO BAND SW SHOWN IN LO BAND POSITION
DO NOT MEASURE
145V LINE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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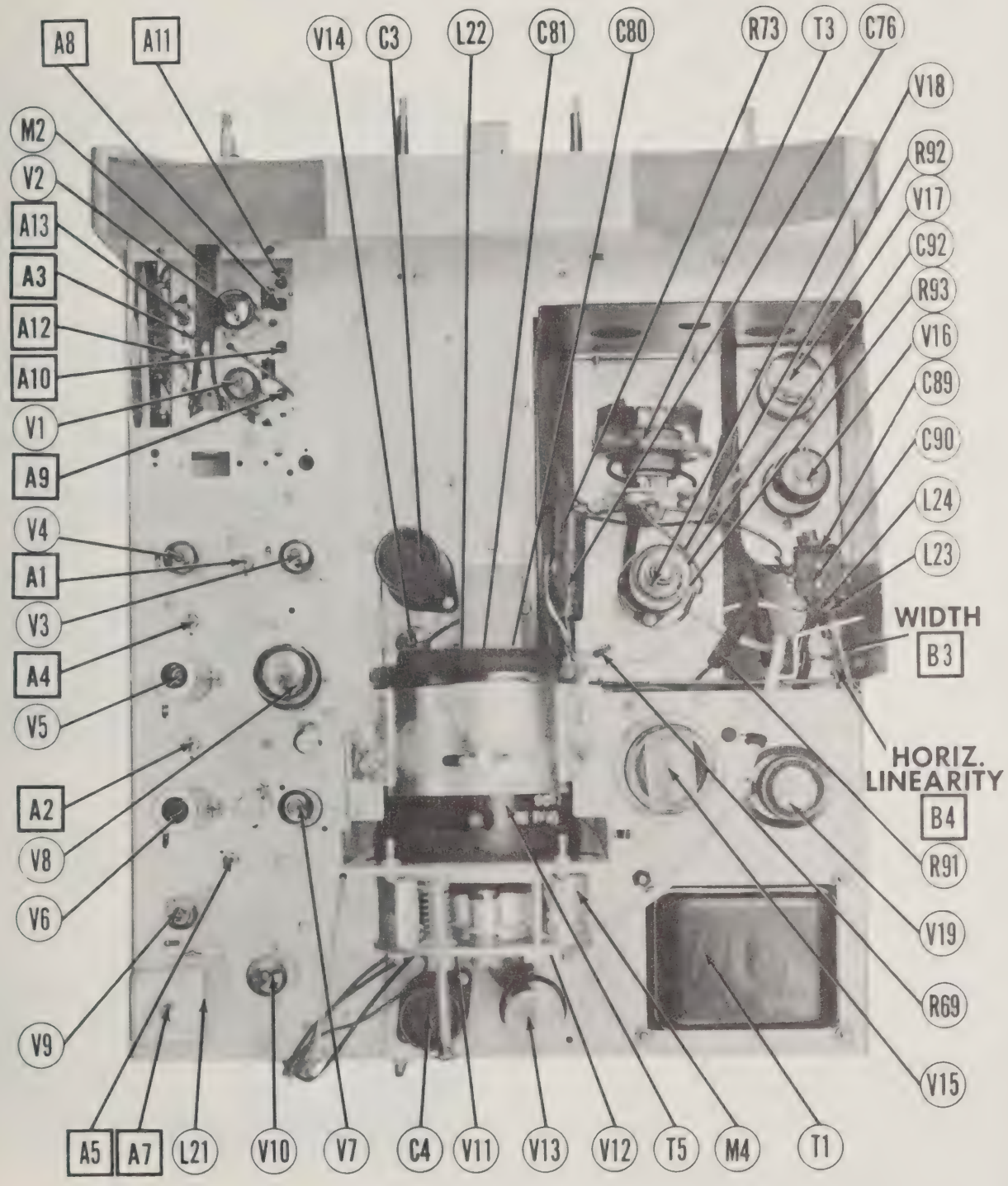
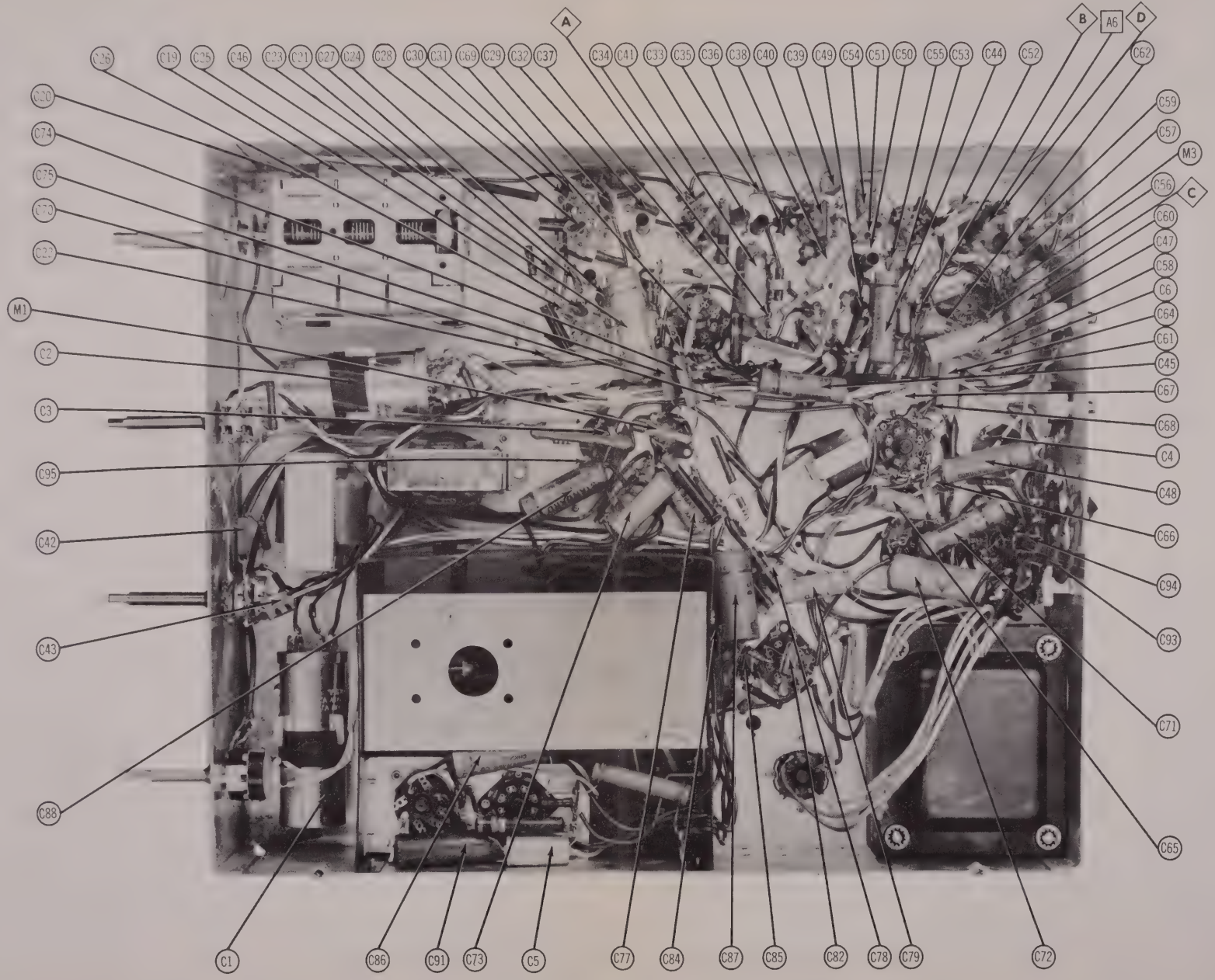
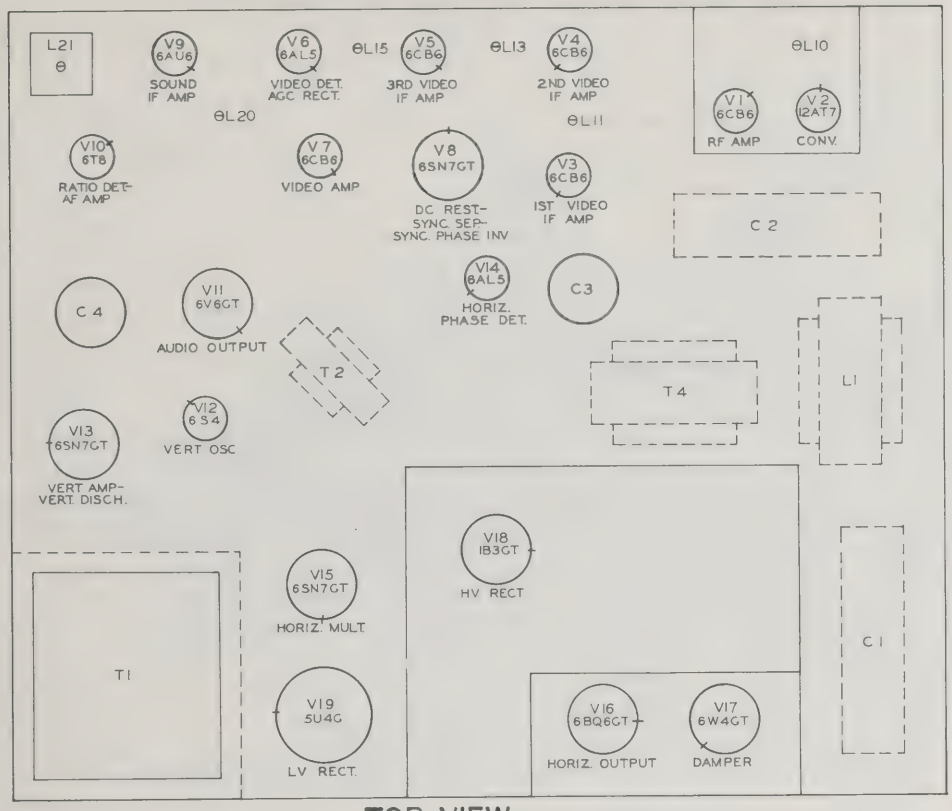


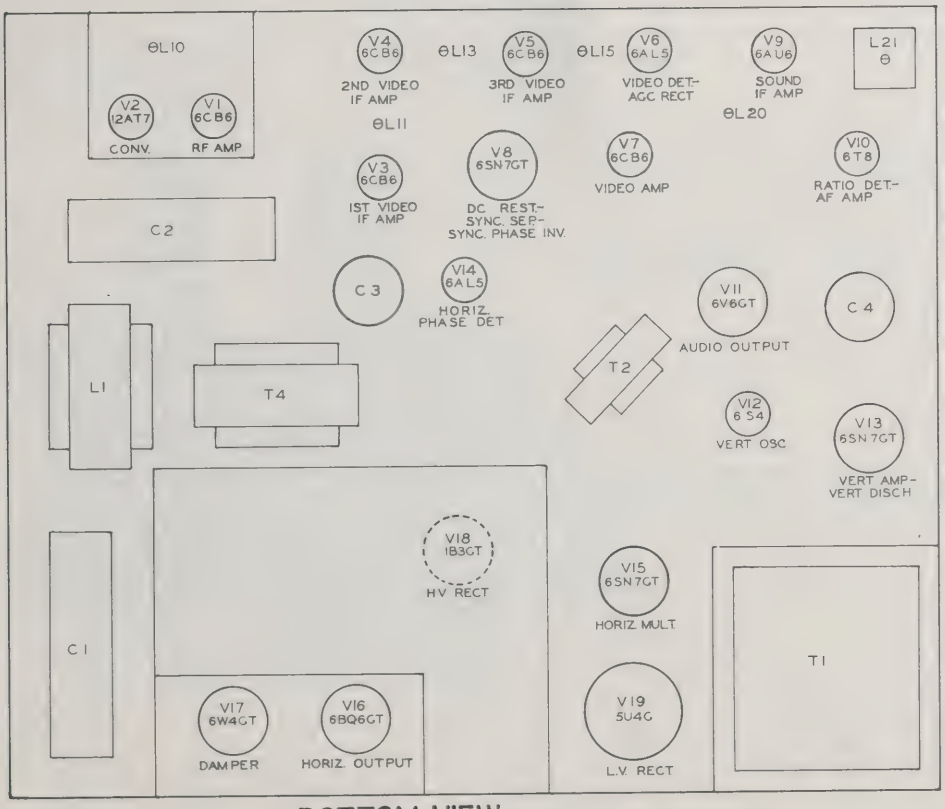
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminatedby removing the horizonal oscillator tube, (V15) from its socket.

VIDEO IF ALIGNMENT

Turn the tuning control to a point which causes no spurious interference To check for interference turn the tuning control slightly, if the meter reading changes tune to another position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube, (V2). Low side to chassis	25.5 MC (unmod.)	Point of non interference. (See note above)	DC probe to point (A). Common to chassis.	A1, A2	Adjust for max. deflection. Attenuate signal gen. to maintain 1 volt reading.
2.	"	"	23 MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Turn the tuning control to a position which causes no interference with the response curve. To check for interference turn the tuning control slightly., if the response changes, tune to another position.
Connect the synchronized sweep voltage from the sugnal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	24MC (10MC Swp.	22.8 MC 26.1 MC	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.		Check for response curve similar to fig 1. If necessary retouch A1 through A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors between alignment points B and C . The junction of these resistors is alignment point E as shown on the schematic. During sound alignment the common lead of the VTVM is connected to approximately 145 volts with respect to chassis. Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.005mfd.	High side to pin 1, (grid) of 6CB6 (V7) Low side to chassis.	4.5MC (unmod)	Any channel not used locally	DC probe to point (B). Common to point (C).	A5, A6	Adjust for maximum deflection
5.	"	"	"	"	DC probe to point (D). Common to point (E).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.005 MFD	High side to pin 1 (grid) of 6CB6, (V7). Low side to chassis.	4.5 MC (450 KC Swp.)	4.5 MC	Any channel not used locally.	Vert. Amp. to point (B). Low side to chassis.	A5, A6	Disconnect stabilizing capacitor C6. Adjust for maximum aplitude and symmetry as per fig. 2
5.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A7	Reconnect capacitor C6. Adjust A7 so 4.5 MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

TUNER ALIGNMENT

Replace the tuning knobs . Make a pencil mark onthe chassis directly over the tuning shaft to use as an index.
Connect the synchronized sweep voltage from the signal generator to the hori zontal input of the oscilloscope for the horizontal deflection.
The sweep generator output lead should be terminated with its Characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	85 MC (10mc Swp.)	83.25 MC 87.75 MC	6	Vert. amp. to point (A) Low side to chassis.	A8, A9 A10	Adjust A8 to place videomarker at 60% on response curve as shown in fig. 4. Adjust A9 and A10 for maximum amplitude of response with band width shown in fig. 4.
7.	"	"	57 MC (10mc Swp)	55.25 MC 59.75 MC	2	"	"	Check to see if video marker can be properly placed with the tuning control near the center of channel 2. If not make compromise adjustment at A8.
8.	"	"	213 MC (10mc Swp.)	211.25 MC 215.75 MC	13	"	A11, A12 A13	Adjust all to place video markerat 60% on response curve as shown in fig. 4. Adjust A12 and A13 for maximum amplitude of response curve.
9.	"	"	177 MC (10mc Swp.)	175.25 MC 179.75 MC	7	"		Check to see if the video marker can be properly placed with the tuning control near the center of channel 7. If not make compromise adjustment of all.

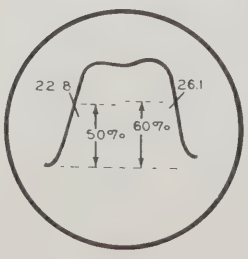


FIG.1

FIG. 2

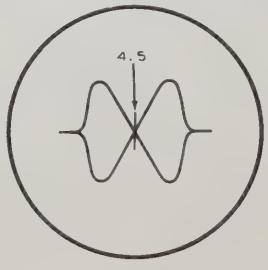


FIG. 3

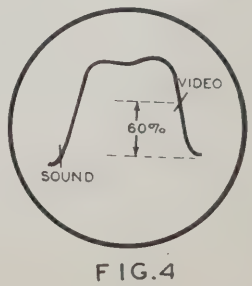
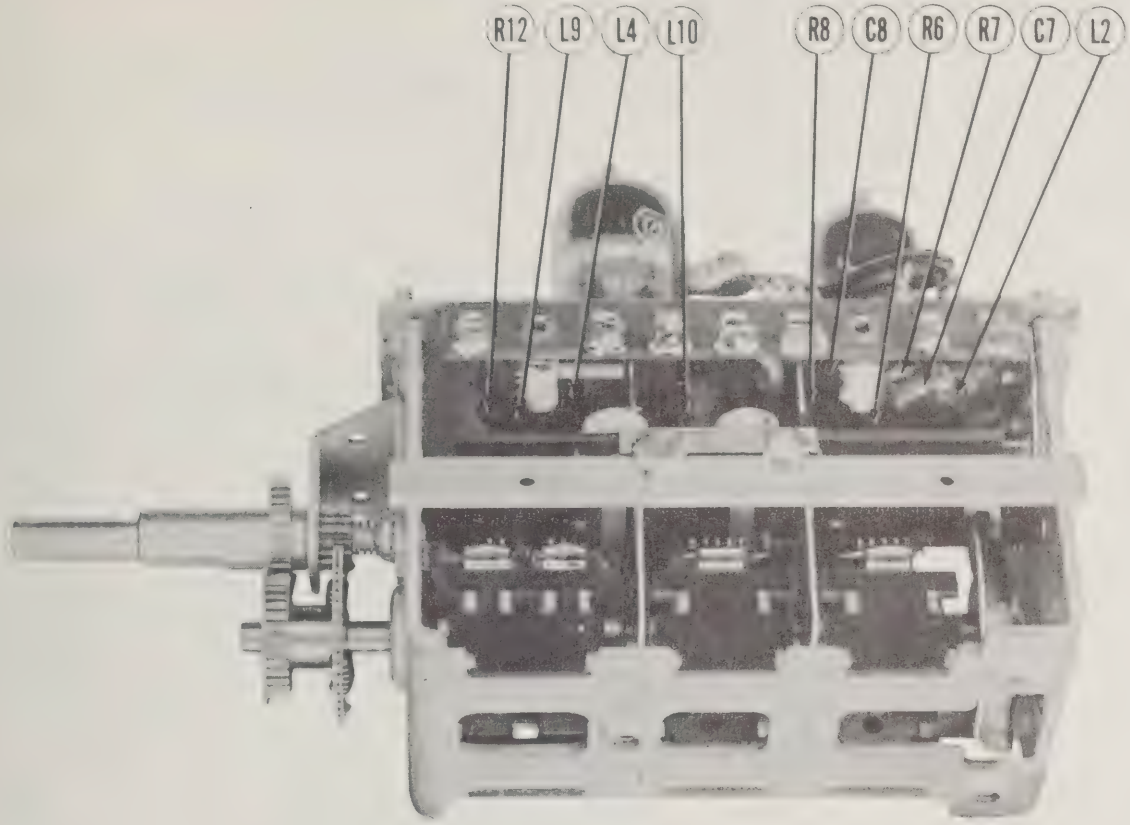
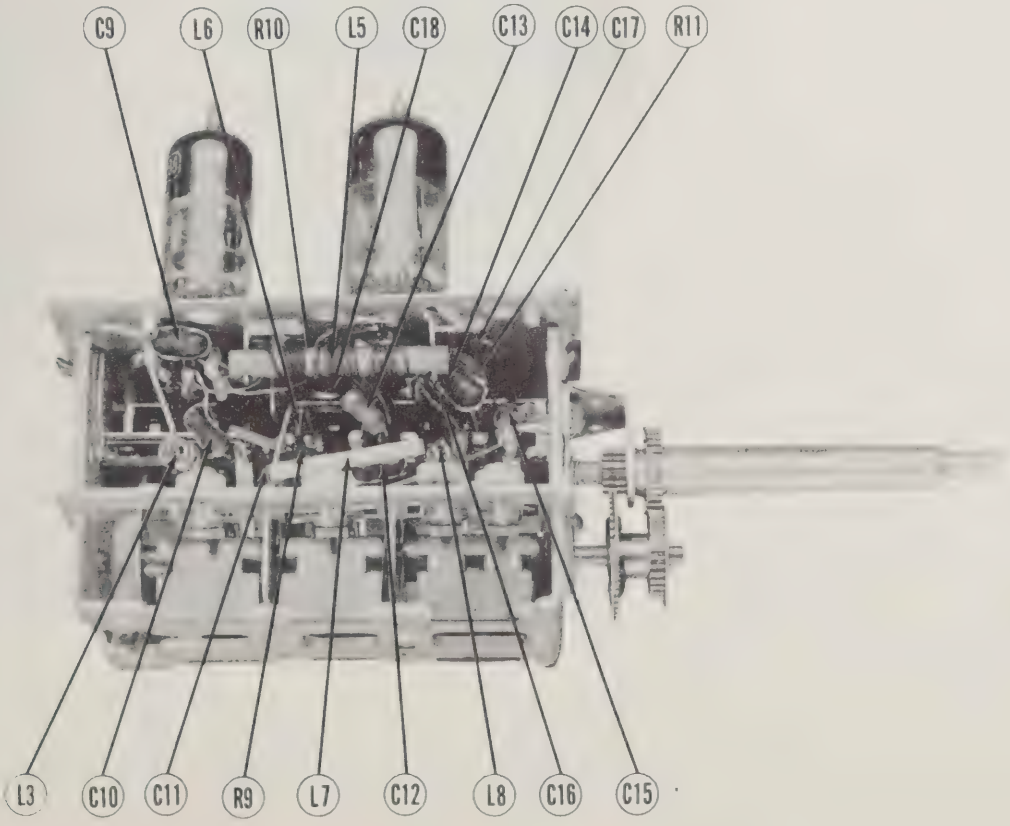


FIG.4



RF TUNER-RIGHT SIDE



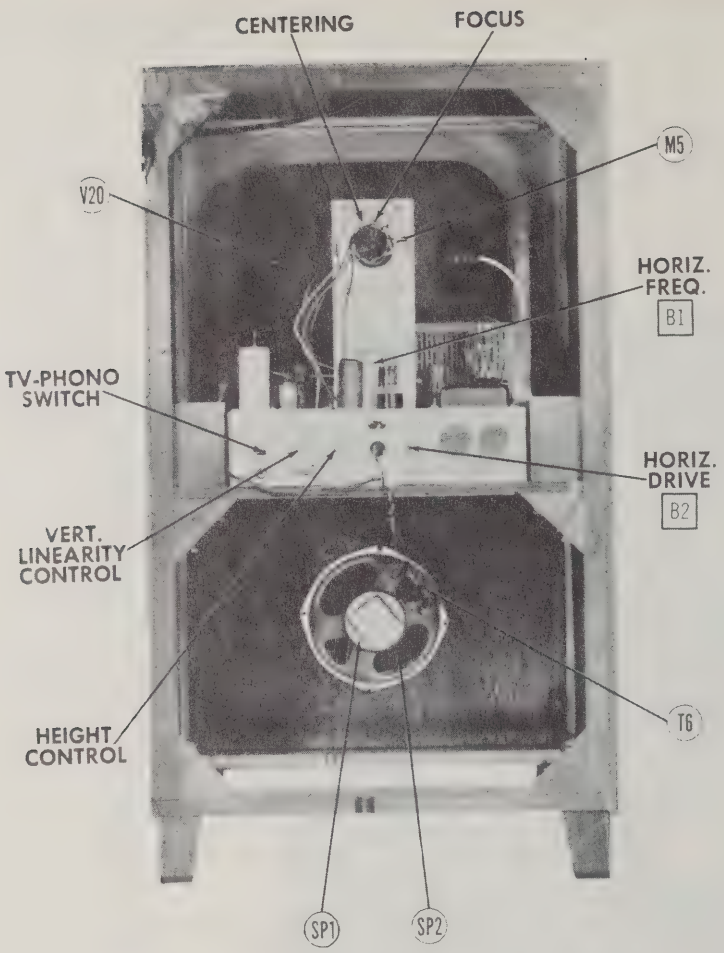
RF TUNER-LEFT SIDE

RESISTANCE MEASUREMENTS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.5Meg	0Ω	.2Ω	0Ω	■2.8KΩ	■2.8KΩ	0Ω		
V 2	12AT7	■100Ω	100KΩ	.0Ω	0Ω	0Ω	■570Ω	18KΩ	0Ω	.3Ω
V 3	6CB6	1.5Meg	130Ω	.1Ω	0Ω	■1.1KΩ	■1.1KΩ	0Ω		
V 4	6CB6	1.5Meg	130Ω	.1Ω	0Ω	†10KΩ	■1KΩ	0Ω		
V 5	6CB6	.3Ω	150Ω	.1Ω	0Ω	■560Ω	■560Ω	150Ω		
V 6	6AL5	.3Ω	680KΩ	.1Ω	0Ω	2.1KΩ	Inf.	6.8KΩ		
V 7	6CB6	1Meg	340Ω	.1Ω	0Ω	■18KΩ	■0Ω	0Ω		
V 8	6SN7GT	■1Meg	■4.2KΩ	2.2KΩ	560KΩ	■1Meg	22KΩ	0Ω	.1Ω	
V 9	6AU6	■150KΩ	■0Ω	■0Ω	■.1Ω	†1KΩ	†8KΩ	■0Ω		
V 10	6T8	Inf.	■13KΩ	Inf.	■.1Ω	■0Ω	■0Ω	■0Ω	■6.8Meg	†220KΩ
V 11	6V6GT	Inf.	■.1Ω	†470Ω	†69Ω	240KΩ	†110KΩ	■0Ω	10KΩ	
V 12	6C4	#2.3Meg	Inf.	.1Ω	0Ω	#2.3Meg	1.4Meg	0Ω		
V 13	6SN7GT	2.2Meg	#9.1KΩ	1.5KΩ	2.2Meg	#9.1KΩ	1.5KΩ	.1Ω	0Ω	
V 14	6AL5	56Ω	56Ω	0Ω	.1Ω	4.8Meg	Inf.	4.8Meg		
V 15	6SN7GT	110KΩ	#190KΩ	1.2KΩ	5.1Meg	#15KΩ	1.2KΩ	.1Ω	0Ω	
V 16	6BQ6GT	Inf.	.1Ω	Inf.	†30KΩ	470KΩ	Inf.	0Ω	100Ω	TOP CAP #60Ω
V 17	6W4GT	Inf.	Inf.	560KΩ	Inf.	†90KΩ	Inf.	■0Ω	■.1Ω	
V 18	1B3GT	PINS 1 THROUGH 8 HAVE INFINITE RESISTANCE								TOP CAP #265Ω
V 19	5U4G	Inf.	16KΩ	Inf.	23Ω	Inf.	21Ω	Inf:	16KΩ	
V 20	16TP4	0Ω	22KΩ	PIN10 †100KΩ	PIN11 †105KΩ	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION
†MEASURED FROM PIN 8 OF V19
■ MEASURED FROM 145 VDC LINE
MEASURED FROM PIN 3 OF 17



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV Station, preferably a test pattern.

Turn the horizontal hold control to the mid position of its range.

Adjust the horizontal frequency slug B 1, to the center of the range over which the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B2), counter-clockwise as far as possible without causing a bright vertical line in the picture.

Adjust the width slug, (B3), until the picture is slightly wider than necessary to fill the mask horizontally.

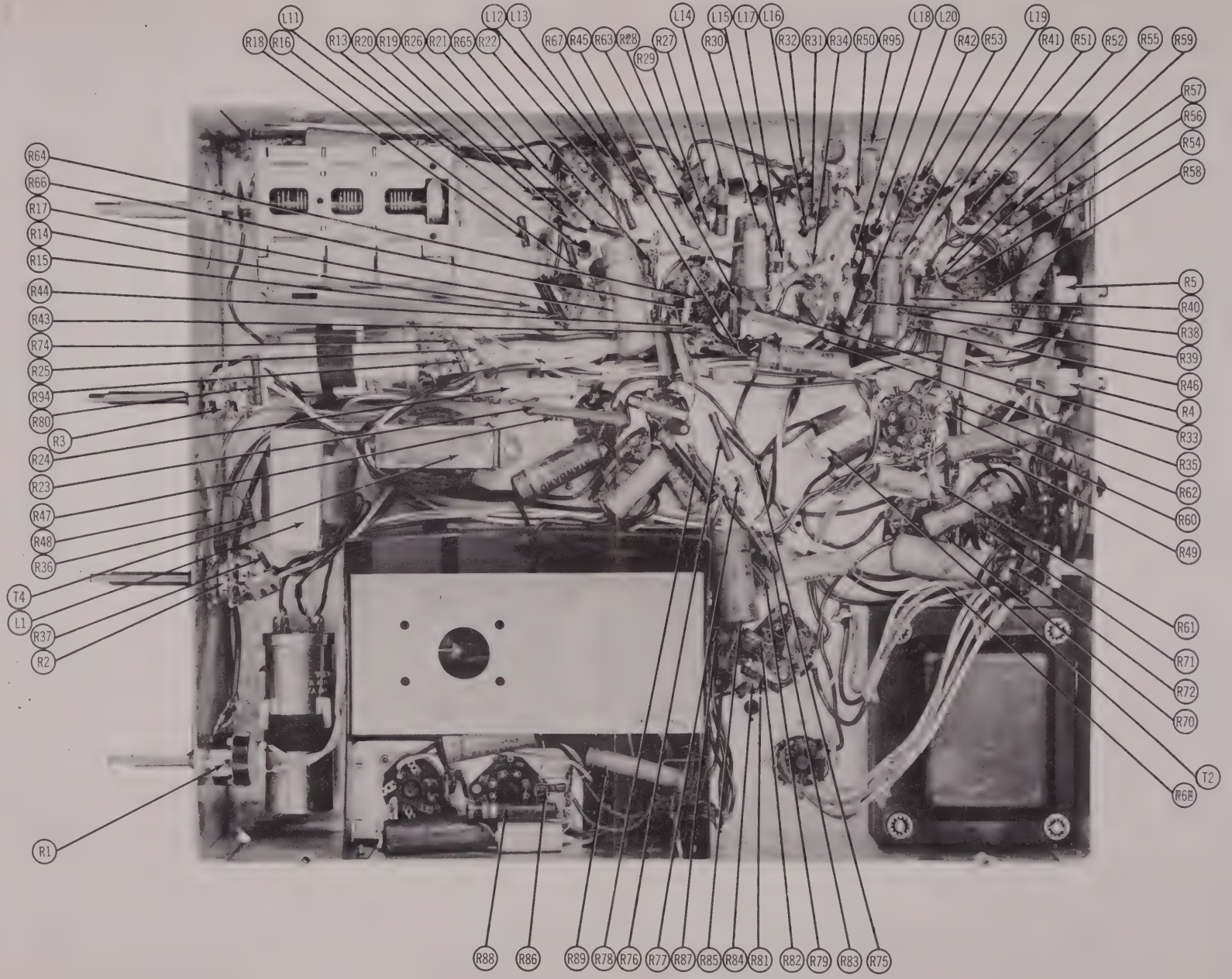
Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right.

Since both width and horizontal linearity are effected by the drive trimmer, it may be necessary to adjust B2, B3, and B4 alternately for the best results.

DISASSEMBLY INSTRUCTIONS

1. Remove seven push-on type control knobs.
2. Remove seven wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Remove four 5/16" hex head bolts from chassis. Remove chassis.
6. Remove two wood screws from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SONORA PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6CB6	6CB6	7CM	
V2	Converter	12AT7	12AT7	9A	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector				
	AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Amplifier	6CB6	6CB6	7CM	
V8A	DC Restorer-Sync. Separator - Sync. Phase Inverter	6SN7GT	6SN7GT	8BD	
B	DC Restorer-Sync. Separator-Sync. Phase Inverter	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	Vert. Oscillator	6C4	6C4	6BG	
V13	Vert. Amplifier Vert. Discharge	6SN7GTA	6SN7GTA	8BD	
V14	Horiz. Phase Det.	6AL5	6AL5	6BT	
V15	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SONORA PART No.	SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V19A	16TP4	16KP4	12D	
B	17BP4A	17BP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	450	N-8038	AFH2-61		UPT62245		TVL-2770	▲ Filter
B	40	450							▲ Filter
C2A	80	200	N-8040	AFH4-120		UPT4145-820		TVL-4700	▲ Decoupling
B	40	200				BRH501			■Decoupling
C	100	50							▲ Vert. Amp. Cathode Decoupling
D	10	450							
C3	100	250	N-8037	AFH1-36		UP8025		TVL-1535	Audio Output Dec.
C4A	10	450	N-8039	AFH2-47		UPT1145		TVL-2750	■ Vert. Amp. Dec.
B	10	450							▲ Vert. Osc. Dec.
C5	4	50	N-8054	PRS150M		BR550		TVA-1303	Horiz. Output Cathode
C6	16	50	N-6912	PRS150/16		BBR66-90		TVA-1409	Stabilizing Cap.
C7	100			SI100	D6-101		GP1K-101	5GA-T1	RF Coupling
C8A	1000			BPD-2X001	DD-2-102		812-001	5HK-2D1	AGC Filter
B	1000								Mixer Plate Dec.
C9	500			SI500	D6-501		GP2K-501	5GA-T5	RF Amp. Dec.
C10	500			SI500	D6-501		GP2K-501	5GA-T5	RF Coupling
C11	25			SI25NP0	TCZ-25		NP0K-250	5TCC-Q25	Fixed Padder
C12	33				TCN-33		N750K-330	5TCU-Q33	Fixed Padder
C13	47			SI47N750	TCN-47		N750L-470	5TCU-Q47	RF Coupling
C14	15				TCN-15		N750K-150	5TCU-Q15	Osc. Grid Cap.
C15	30				TCN-30		N750K-300		Fixed Padder
C16	5			SISN750			N750K-050		Osc. Feedback
C17A	1000			BPD-2X001	DD-2-102		812-001	5HK-2D1	Osc. Plate Dec.
B	1000								Conv. Filter
C18	20			SI20NP0	TCZ-20		NP0K-200		Fixed Trimmer
C19	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	RF Bypass
C20	5000			BPD-005	DD-502		811-005	5HK-D5	Fil. Bypass
C21	1500			BPD-0015	DD-152		801-0015	5HK-D15	RF Bypass †
C22	100		N-6015	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C23	1000		N-6887	BPD-001	DD-102	1W5D1	801-001	5HK-D1	AGC Filter
C24	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st. Video IF Dec.
C25	1500		N-7371	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	1st. Video IF Cathode
C26	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st. Video IF Filter
C27	100		N-6015	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C28	1000		N-6887	BPD-001	DD-102	1W5D1	801-001	5HK-D1	AGC Filter
C29A	4000		N-7774	BPD-2X004	D6-402	1D5D4	822-004	5HK-2D4	2nd. Video IF Plate
B	4000				D6-402	1D5D4			2nd. Video IF Screen
C30	1500		N-7371	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	2nd. Video IF Cathode
C31	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd. Video IF Filter
C32	100		N-6015	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C33	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd. Video IF Dec.
C34A	4000		N-7774	BPD-2X004	D6-402	1D5D4	822-004	5HK-2D4	3rd. Video IF Cathode
B	4000				D6-402	1D5D4			3rd. Video IF Filter
C35	100		N-6015	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C36	100		N-6015	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C37	.25	400	N-2579	P488-25		GP4P25		4TM-P25	AGC Filter
C38	.01	400	N-1344	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	RF Bypass
C39	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Video Det. Filter
C40	10	500	N-7843	1469-00001	TCZ-10	5R5Q1	NP0K-100	MS-41	Video Det. Filter
C41	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	Video Coupling
C42	.0003	500	N-8106	1468-0002	D6-201	5W5T2	GP2K-201	1FM-32	Video Amp. Cathode §
C43	47	500	N-7836	1469-00005	TCZ-47	5R5Q5	NP0L-470	MS-45	Cont. Cont. Shunt
C44	.1	400	N-1623	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C45	.1	400	N-1623	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C46	.5	200	N-6896	P288-5		GT2P5		2TM-P5	DC. Rest. Cathode
C47	.1	200	N-1351	P288-1	DF-104	PTE4P1		2TM-P1	Picture Tube Cathode
C48	.1	400	N-1623	P488-1	DF-104	PTE4P1		4TM-P1	Acc. Anode Dec.
C49	5		N-7776	SISNP0	TCZ-4.7		NP0K-050		Sound IF Coupling
C50	68		N-7844				N080-338-880		Fixed Trimmer
C51	47	500	N-7836	1469-00005	TCZ-47	5R5Q6	NP0L-470	MS-45	Sound IF Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C52	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sound IF Plate Dec.
C53	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sound IF Screen Bypass
C54	.02	400	N-1376	P488-02	DF-203	PTE4S2		4TM-S2	Sound IF Cathode Dec.
C55	5000		N-6272	BPD-005	DD-502	1D5D5	811-006	5HK-D5	RF Bypass
C56	2200	500	N-6891	1467-0025	D6-222	1W5D25	GP2-333-222		RF Bypass
C57	3900	500	N-6892	1467-004	D6-392	1DR5D4	GP2-333-392	1FM-34	De-emphasis
C58	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C59	.02	400	N-1376	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C60	.08	200	N-8092						Phono Isolation
C61	.005	600	N-4894	P688-006	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C62	100		N-6015	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	AF Amp. Plate Bypass
C63	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AF Amp. Fil. Bypass ¶
C64	.02	400	N-1376	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C65	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	Audio Output Grid Dec.
C66	5000		N-6272	BPD-005	DD-502	1D5D5	811-006	5HK-D5	Audio Output Cath. Dec. ¶
C67	.005	600	N-4894	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C68	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C69A	.002			P688-002		PTE6D2	GP2-333-202		Vert. Integrator Net.
B	.005		*N-8042	P688-005	*PC-100	PTE6D5	GP2-333-502	*101C1	Vert. Integrator Net.
C	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C70	4700	500	N-6893	1464-005		1DR5D5		MS-25	Vert. Osc. Grid Cap.
C71	.1	400	N-1623	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Discharge
C72	.25	400	N-2579	P488-25		GT4P25		4TM-P25	Vert. Sweep Coupling
C73	.05	400	N-1346	P488-05	DF-503	PTE4S5		4TM-S5	Fixed Trimmer
C74	1200	500	N-7783		D6-122		GP2-333-122		Horiz. Sync. Coupling †
C75	1200	500	N-7783		D6-122		GP2-333-122		Horiz. Sync. Coupling †
C76	.05	1000	N-8105	P1088-05		GT16S5		MB-S5	Horiz. Feedback
C77	.1	200	N-1351	P288-1	DF-104	PTE4P1		2TM-P1	AFC Filter
C78	.005	600	N-4894	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	AFC Filter
C79	.1	200	N-1351	P288-1	DF-104	PTE4P1		2TM-P1	AFC Filter
C80	900	500		1464-0009		2R5T9		MS-39	Fixed Trimmer §§
C81	3000	500		1464-003		1R5D3		MS-23	Fixed Trimmer ¶
C82	330	500	N-7777	1469-00035					Horiz. MV Feedback
C83	47	500	N-7836	1469-00005		5R5Q5		MS-45	Horiz. MV Grid ¶
C84	560	500	N-7780						Horiz. Discharge **
C85	270	500	N-8074	1468-0003	D6-270	5R5T3	GP2K-271	MS-33	Horiz. Sweep Coupling
C86	.25	400	N-2579	P488-25		GT4P25		4TM-P25	Horiz. Output Screen
C87	.25	600	N-6895	684-25		GT6P25		6TM-P25	Horiz. MV Det.
C88	.25	200	N-1479	P488-25		GT2P5		2TM-P5	Horiz. Sweep Coupling ¶¶
C89	800	500		1464-0008		2R5T8		MS-38	Fixed Trimmer ††
C90	800	500		1464-0008		2R5T8		MS-38	Fixed Trimmer ¶
C91	.05	1000	N-8105	P1088-05		GT16S5		MB-S5	Damper Filter
C92	500	20000	N-8041	HV20C	TV3-502				HV Filter
C93	.01	600	N-6979	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C94	.01	600	N-6979	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C95	5000		N-6272	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass ¶

† Some Models may use a 5000 MMF Capacitor in this application
§ Some Models may use a 220 MMF Capacitor in this application
¶ Not used in all Models
* C69A, C69B, C69C, R66A, R66B, and R66C are combined in one unit
†† Some Models may use a 1100 MMF Capacitor in this application
§§ Some Models may use a 3900 MMF Capacitor in this application
** Some Models may use a 390 MMF Capacitor in this application
¶¶ Some Models may use a .5MFD Capacitor in this application
†† Some Models may use a 1500MMF Capacitor in this application

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	SONORA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	½	N-7172	Q13-133	AG-60-Z	BSX-60-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per Instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per Instructions.
R2A	50KΩ	½	N-8053				Brightness Control-Panel
B	2500Ω	½					Contrast Control-Rear-Tap@2000Ω
R3A	1Meg	½	N-7338	QJ-171 *			Vertical Hold Control-Panel
B	50KΩ	½					Horiz. Hold Control-Rear
R4A	2.5 Meg	½	N-7341	Q11-239	AG-84-S	AB-83	Height Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A Per Instructions
R5A	3000Ω	½	N-8071	Q11-112	AG-15-S	B-8	Vert. Linearity Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R5A Per Instructions

* CONCENTRIKIT EQUIVALENT-KIT K-2. BASE ELEMENTS & SHAFTS, B11-137&P1-200(PANEL), B11-123 & R2-212(REAR)

RESISTORS

ITEM No.	RATING: RESISTANCE	WATTS	SONORA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS † 10% UNLESS OTHERWISE SPECIFIED
R6	100KΩ	½		BTS-100K	Antenna Isolation
R7	1000Ω	½		BTS-1000	RF Amp. Grid
R8	2700Ω	½		BTS-2700	RF Amp. Coupling
R9	2200Ω	½		BTS-2200	Parasitic Suppressor
R10	100KΩ 20%	½		BTS-100K	Mixer Grid
R11	18KΩ 5%	½			Osc. Grid
R12	470Ω 20%	½		BTS-470	Osc. Plate
R13	47000Ω 20%	½		BTS-4700	AGC Network
R14	7500Ω	½			1st. Video IF Amp. Grid - See Note 3
R15	47Ω	½	N-6237		1st. Video IF Amp. Cathode
R16	82Ω	½	N-5857	BTS-82	1st. Video IF Amp. Cathode
R17	1000Ω	½	N-3341	BTS-1000	1st. Video IF Amp. Decoupling
R18	1000Ω	½	N-3341	BTS-1000	AGC Network
R19	15KΩ	½	N-6424	BTS-15K	2nd. Video IF Amp. Grid
R20	47Ω	½	N-6237		2nd. Video IF Amp. Cathode
R21	82Ω	½	N-5857	BTS-82	2nd. Video IF Amp. Cathode
R22	1000Ω	½	N-3341	BTS-1000	2nd. Video IF Amp. Screen
R23	13KΩ	5	N-8036		2nd. Video IF Amp. Plate Decoupling
R24	47KΩ	2	N-8033	BTB-47K	Voltage Divider
R25	15KΩ	2	N-2970	BTB-15K	Voltage Divider
R26	1000Ω	½	N-3341	BTS-1000	AGC Network
R27	6800Ω	½	N-4630	BTS-6800	3rd. Video IF Coil Shunt
R28	150Ω	½	N-3663	BTS-150	3rd. Video IF Amp. Cathode
R29	560Ω	½	N-4280	BTS-500	3rd. Video IF Amp. Decoupling
R30	6800Ω	½	N-4630	BTS-6800	Video Detector Diode Load
R31	820KΩ	½	N-4469	BTS-820K	AGC Network
R32	680KΩ 20%	½	N-7403	BTS-680K	AGC Rectifier Diode Load
R33	100Ω	½	N-1349	BTS-100	Parasitic Suppressor

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	WATTS	SONORA PART No.	IRC PART No.	IDENTIFICATION CODES
R34	1Meg	½	N-2976	BTS-1Meg	Video Amp. Grid
R35	47Ω	½	N-6237		Video Amp. Cathode
R36	180Ω	½	N-4067	BTS-180	Video Compensation Network
R37	1500Ω 20%	½	N-7398	BTS-1500	Video Compensation Network
R38	18KΩ	2	N-8031	BTB-18K	Voltage Divider - See Note 2
R39	15KΩ	2	N-2970	BTB-15K	Voltage Divider
R40	33KΩ	1	N-8044	BTA-33K	Voltage Divider
R41	4700Ω	2		BTB-4700	Video Amp. Plate Decoupling
R42	2200Ω	½	N-4896	BTS-2200	Isolation
R43	560KΩ	½	N-7790	BTS-560K	Sync. Separator Grid
R44	22KΩ	½	N-8013	BTS-22K	Sync. Separator Cathode
R45	1Meg	½	N-2976	BTS-1Meg	Sync. Separator Plate
R46	68KΩ 20%	½	N-4120	BTS-68K	Picture Tube Cathode
R47	390KΩ	½	N-8026	BTS-390K	Voltage Divider
R48	15KΩ	½	N-6424	BTS-15K	Voltage Divider
R49	100KΩ	½	N-2973	BTS-100K	Acc. Anode Load
R50	150KΩ	½	N-4468	BTS-150K	Isolation
R51	8200Ω	1	N-8043	BTA-8200	Sound IF Amp. Screen - See Note 2
R52	1000Ω	½	N-3341	BTS-1000	Sound IF Amp. Decoupling
R53	27KΩ	1	N-7012	BTA-27K	Voltage Divider
R54	13KΩ 5%	½			Ratio Detector Diode Load - See Note 4
R55	270Ω	1	N-4121	BTA-270	Balancing
R56	560Ω	½	N-4280	BTS-560	Balancing
R57	15KΩ	½	N-6424	BTS-15K	De-Emphasis
R58	6.8Meg	½	N-4028	BTS-6.8Meg	AF Amp. Grid
R59	220KΩ	½	N-4899	BTS-220K	AF Amp. Plate
R60	300KΩ 5%	2	N-8025		Voltage Divider
R61	180KΩ 20%	1		BTA-180K	Voltage Divider
R62	100KΩ	½	N-2973	BTS-100K	Output Grid
R63	2200Ω	1		BTA-2200	Sync. Phase Inverter Cathode
R64	1500Ω	½	N-7398	BTS-1500	Sync. Phase Inverter Plate
R65	2700Ω	½	N-8103	BTS-2700	Voltage Divider - See Note 2
R66A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½	*N-8042	BTS-8200	Integrator Network
C	8200Ω	½		BTS-8200	Integrator Network
R67	1.2Meg 20%	½	N-4470	BTS-1.2Meg	Vertical Osc. Grid
R68	1Meg	½	N-2976	BTS-1Meg	Vertical Osc. Plate
R69	56KΩ	½	N-4823	BTS-56K	Vertical Osc. Decoupling
R70	1800Ω	½		BTS-1800	Vertical Peaking - See Note 5
R71	2.2Meg	½	N-4424	BTS-2.2Meg	Vertical Output Grid
R72	820Ω	½	N-4279	BTS-820	Vertical Output Cathode
R73	8200Ω	5	N-8035		Vertical Output Plate - See Note 6
R74	10KΩ	½	N-4895	BTS-10K	Voltage Divider
R75	100KΩ	½	N-2973	BTS-100K	Horiz. Phase Detector Diode Load
R76	100KΩ	½	N-2973	BTS-100K	Horiz. Phase Detector Diode Load
R77	4.7Meg 20%	½	N-4061	BTS-4.7Meg	Horiz. Phase Detector Diode Load
R78	56Ω	1	N-8155		AFC Filter
R79	470KΩ	½	N-5694	BTS-470K	AFC Filter
R80	100KΩ	½	N-2973	BTS-100K	Horiz. Hold Control Shunt
R81	100KΩ	½	N-2973	BTS-100K	Horiz. MV Grid
R82	1200Ω	½	N-6793	BTS-1200	Horiz. MV Cathode - See Note 2
R83	5600Ω	½	N-7406	BTA-5600	Horiz. MV Plate
R84	180KΩ 20%	½		BTA-180K	Horiz. MV Plate
R85	4700Ω	½		BTS-4700	Horiz. Peaking - See Note 3
R86	100Ω	½	N-1349		Parasitic Suppressor
R87	470KΩ	½	N-5694	BTS-470K	Horiz. Output Grid
R88	100Ω	2	N-8030	BW-2-100	Horiz. Output Cathode - Wire Wound
R89	33KΩ	2	N-8032	BTB-33K	Horiz. Output Screen
R90	100KΩ	1	N-8028	BTA-100K	Horiz. Output Screen - See Note 1
R91	10KΩ	2	N-4229	BTB-10K	Horiz. MV Decoupling
R92	4.3Ω	½	N-8126		HV Filament - Wire Wound
R93	470KΩ	½	N-8029		HV Filter
R94	100Ω	½	N-1349	BTS-100	Decoupling
R95	150KΩ	½	N-4468	BTS-150K	Voltage Divider

* R66A, R66B, R66C, C69A, C69B, C69C, are combined in one unit.
Note 1. Not used in all Models
Note 2. Some Models use resistors in parallel to obtain desired value
Note 3. Some Models use 6800Ω resistor in this application
Note 4. Some Models use 12KΩ resistor in this application
Note 5. Some Models use 3900Ω resistor in this application
Note 6. Some Models use 5300Ω resistor in this application

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: SONORA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.82A	660VCT .230ADC	5VAC @3.0A	6.3VAC @ 6.0A SEC. 4 6.3VAC @ 2.5A	N-8069		P-3070	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	SEC.	REPLACEMENT DATA: SONORA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	175Ω	950Ω	N-7764	A-8111 ②	A-3000②	TB0-1 ③	Vert. Blocking Osc. Trans.
T3	265Ω	0Ω	N-8104	A-8130	HV0-7		Horiz. Output Trans.
	Tapped @ 20Ω	Tapped @ 6Ω	N-8070 ④				
		SEC. 2 0Ω					
T4	1270Ω		N-7717	A-8123	A-3036	TS0-5	Vert. Output Trans.
	Tapped @ 10Ω						
T5A	9Ω		N-8057	DY-8	MDF-70		Horiz. Deflection Coils
B	51Ω						Vert. Deflection Coils

② Drill one New Mounting Hole.
③ Mount Above Chassis
④ Used in some Models

PARTS LIST CONTINUED ON PAGE 15

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PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SONORA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T6	4.7KΩ	3.3Ω	400Ω	.85Ω	Part of N-8055	A-3849	A-3019	RO-9	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	SONORA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P.M.	3.3Ω	N-8055	ST-115 Mod. P8-V	8A21	Used in Consolette Models only
SP1	P.M.	3.3Ω	N-8170	ST-105 Mod. P5-X	5A1	Used in Table Models only
	CONE DIA.	V. C. DIA.				
SP2	7½"	9/16"				
SP2	5"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	SONORA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.230A	69Ω	2.6 Henries	N-8064	C-2326①	C-2991①	TR-3300 ①	① Drill one new Mounting Hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	SONORA PART No.	MERIT PART No.	IRC PART No.	
L2	Ant. Trans.	.2Ω	.2Ω				
L3	Ant. Shunt Coil	.2Ω					
L4	Fil. Choke	.1Ω					
L5	RF Mixer Grid Osc.	0Ω					Lo-Band
L6	RF Coil	0Ω					Hi-Band
L7	Mixer Coil	0Ω					Hi-Band
L8	Osc. Coil	0Ω					Hi-Band
L9	Cath. Choke	.1Ω					
L10	1st. Video IF	.1Ω					
L11	2nd. Video IF	.5Ω		N-7745			
L12	RFChoke	8.2Ω		N-7321		CL-1	10 Michrohenries
L13	3rd. Video IF	.5Ω		N-7745			
L14	RF Choke	8.2Ω		N-7321		CL-1	10 Michrohenries
L15	4th. Video IF	.5Ω		N-7745			
L16	Peaking Coil	6.2Ω		N-8060			174 Michrohenries wound on 18K Resistor
L17	Peaking Coil	16Ω		N-8059			
L18	Peaking Coil	7Ω		N-8061			217 Michrohenries wound on 22K Resistor
L19	Peaking Coil	12Ω		N-8062			578 Michrohenries wound on 5.6K Resistor
L20	Sound IF	1.3Ω		N-7746			
L21	Ratio Det. Trans.	3.4Ω	.5Ω	N-7744			Tap at .6Ω
L22	Horiz. Osc.	65Ω		N-7748			
L23	Width Coil	22Ω		N-8134			
L24	Horiz. Lin.	43Ω		N-8063			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			SONORA PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	1/4A.			318.250		GJV-1/4		

MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M2	RF Tuner		
M3	Switch	N-8099	T.V. - Phono
M4	Focus Magnet	N-8067	
M5	Ion Trap	N-7929	
B2	Trimmer	N-7375	20-270MMF (Horiz. Drive)

PHOTOFACT* Folder

SPARTON MODELS
5212, 5250, 5252, 5253 (Ch. 215172)

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MODEL 5212

SPARTON MODELS
5212, 5250, 5252, 5253 (Ch. 215172)

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DATE 7-52 SET 174 FOLDER 12

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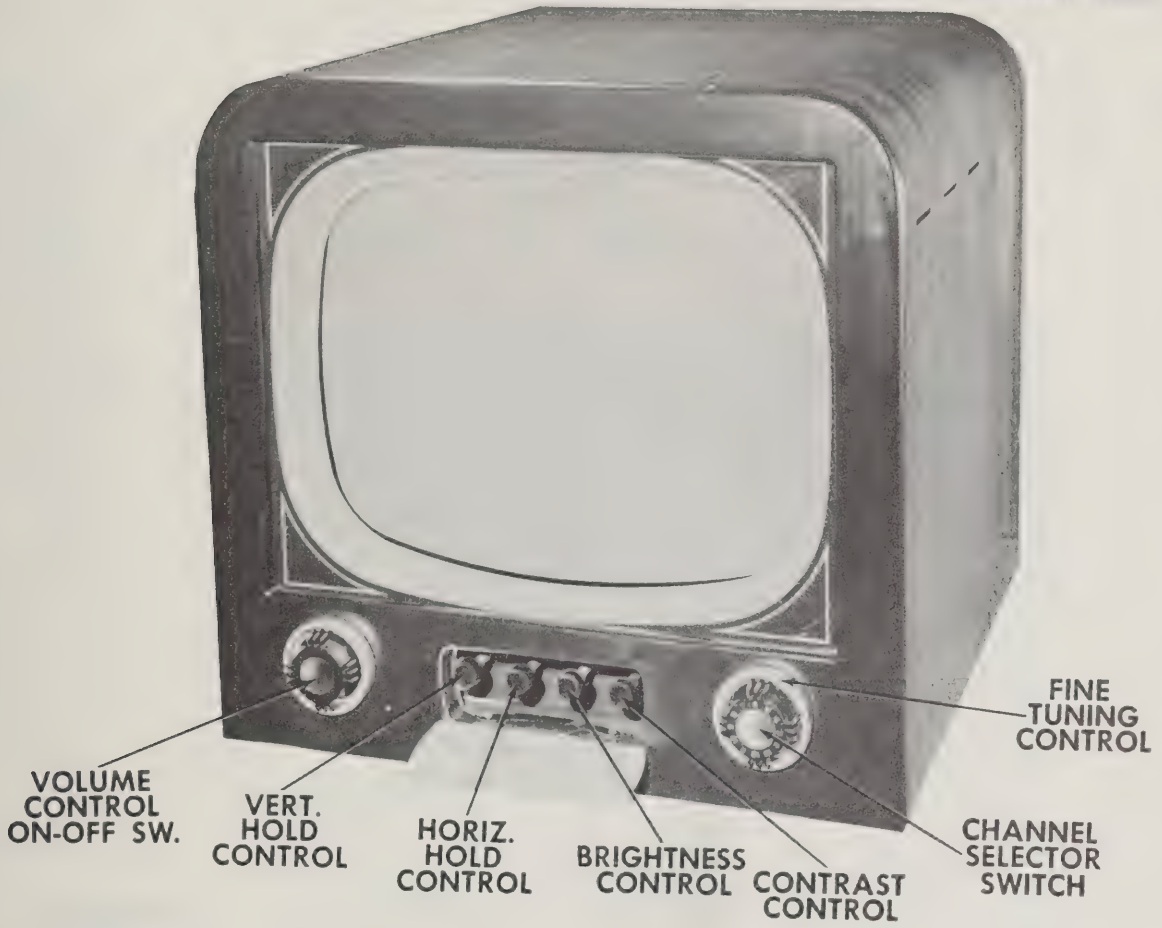
*TRADE MARK

SPARTON MODELS 5212, 5250, 5252, 5253 (Ch. 21S172)



SPARTON MODELS 5212, 5250, 5252, 5253 (Ch. 21S172)

SPARTON 5212

TRADE NAME	Sparton Models 5212, 5250, 5252, 5253 (Ch. 21S172)
MANUFACTURER	Sparks-Withington Co., Jackson, Mich.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING 1.74 Amp. @ 117 volts AC
TUNING RANGE-	Channels 2 thru 13 — SHORT WAVE

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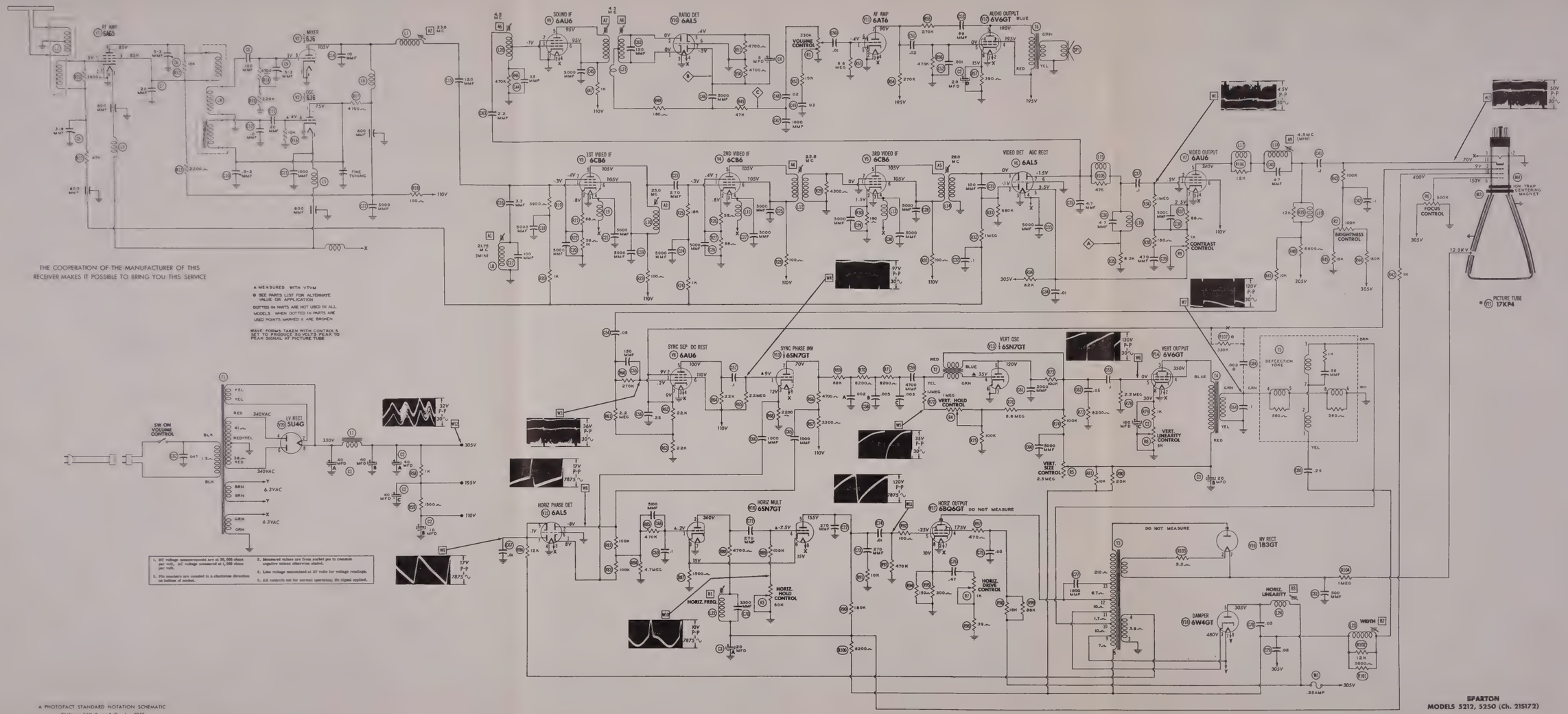
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A MEASURED WITH VTVM
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
RF AMP V1 6AG5
MIXER V2 6J6
OSC V3 6J6
SOUND IF V9 6AU6
RATIO DET V14 6AL5
AF AMP V11 6AT6
AUDIO OUTPUT V12 6V6GT BLUE
VOLUME CONTROL
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
VIDEO DET AGC RECT V6 6AL5
VIDEO OUTPUT V7 6AU6
CONTRAST CONTROL
BRIGHTNESS CONTROL
FOCUS CONTROL
ION TRAP CENTERING MAGNET
PICTURE TUBE V21 17KP4
SYNC SEP DC REST V8 6AU6
SYNC PHASE INV V13 6SN7GT
VERT OSC V15 6SN7GT
VERT HOLD CONTROL
VERT OUTPUT V16 6V6GT
VERT LINEARITY CONTROL
VERT SIZE CONTROL
DEFLECTION YOKE
HORIZ PHASE DET V15 6AL5
HORIZ MULT V10 6SN7GT
HORIZ OUTPUT V17 6BQ6GT DO NOT MEASURE
HORIZ HOLD CONTROL
HORIZ FREQ
HORIZ DRIVE CONTROL
HV RECT V18 1B3GT
DAMPER V18 6W4GT
HORIZ LINEARITY
WIDTH
SW ON VOLUME CONTROL
LV RECT V20 5U4G
340VAC
6.3VAC
330V
305V
195V
110V
1. DC voltage measurements are at 30,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Measured values are from socket pin to common negative unless otherwise stated.
3. Pin numbers are counted in a clockwise direction on bottom of socket.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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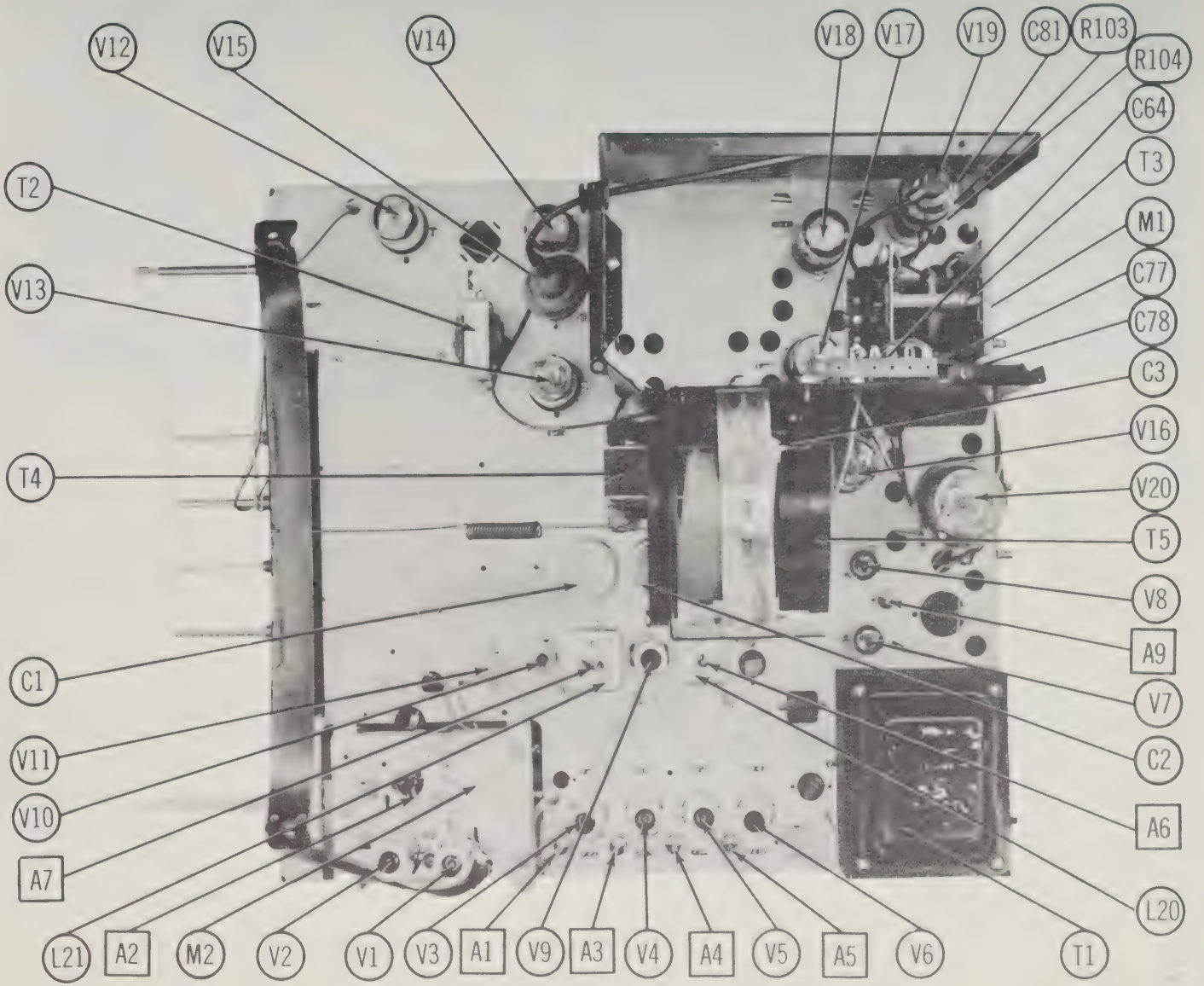
SPARTON
MODELS 5212, 5250 (Ch. 215172)

SPARTON
MODELS 5212, 5250 (Ch. 215172)



CHASSIS TOP VIEW

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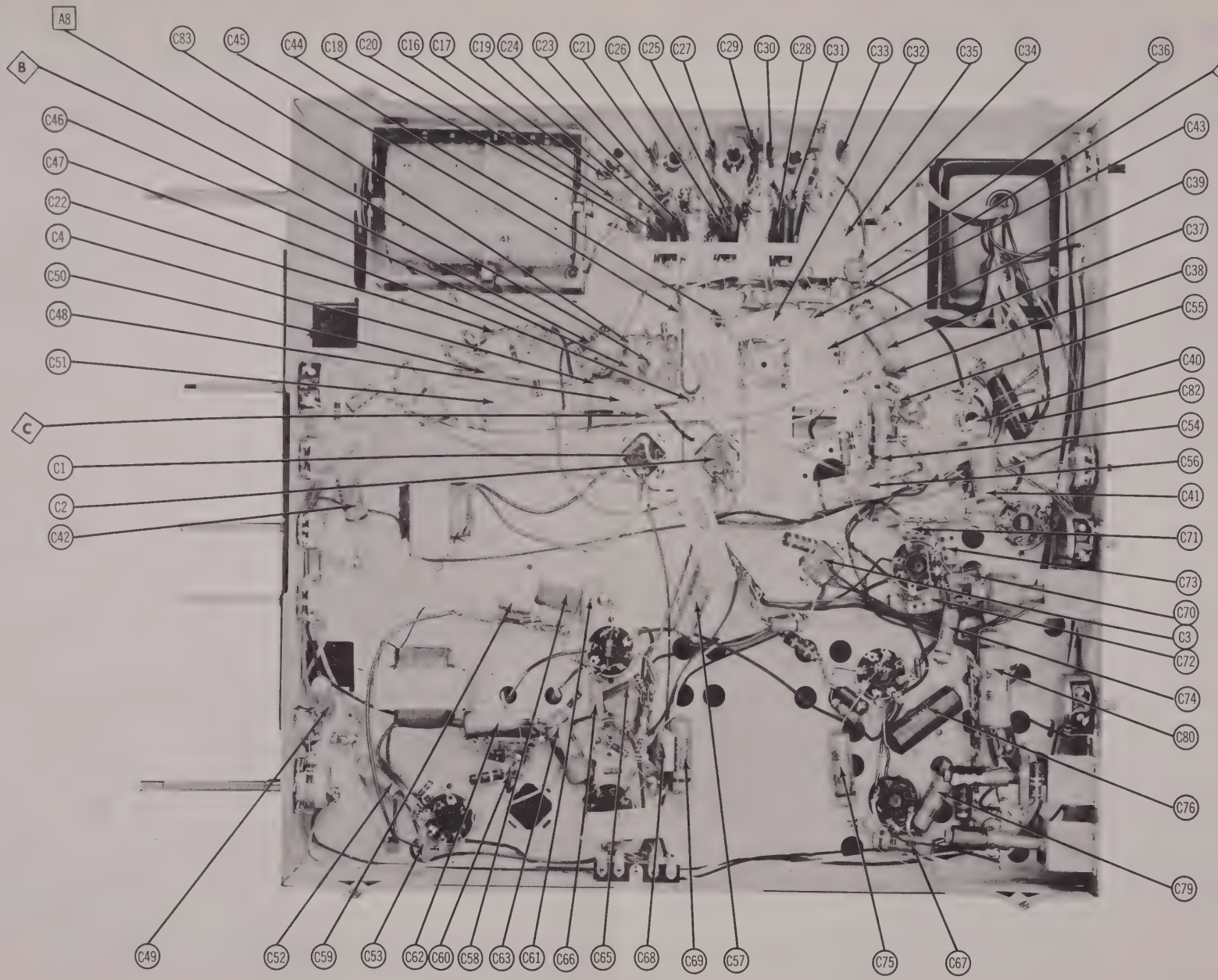
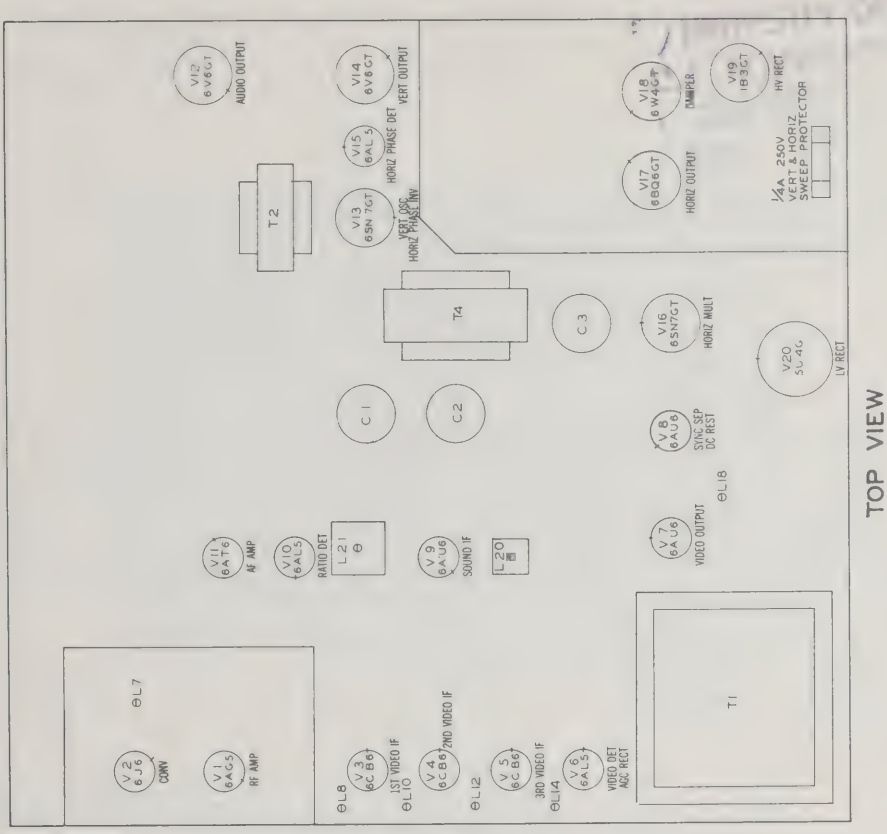
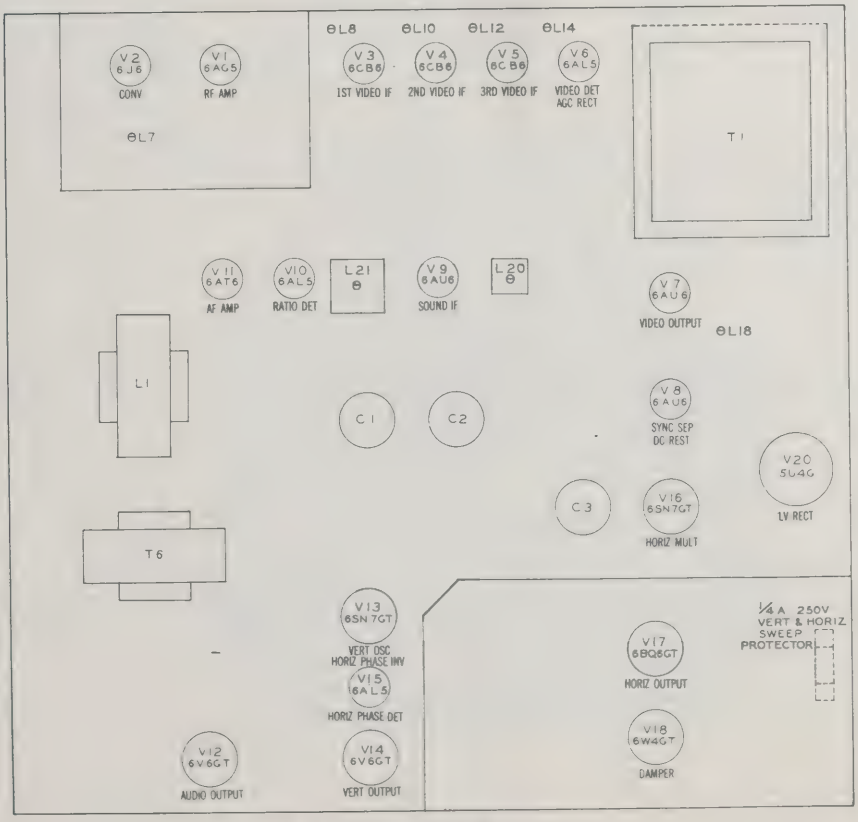


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removal of the horizontal multivibrator tube (V16) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2)from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C32. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	21.75MC (unmod.)	Any	DC probe to Point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2	"	"	23MC	"	"	A2	Adjust for maximum deflection.
3	"	"	25MC	"	"	A3	"
4	"	"	23.8MC	"	"	A4	"
5	"	"	26MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Leave the 3 volt bias battery connected as under Video IF Alignment .
Connect a 47KΩ Resistor in series with the high lead to the vertical amplifier of the scope. Connect a 50MMF capacitor across the input terminals of the vertical amplifier.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	24.5MC (10MC swp.)	23.25MC 24MC 25.5MC 26.25MC	Any	Vert. amp. thru 47KΩ to Point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A2 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7	.01MFD	High side to pin 1 of 6AL5 (V6). Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point (B). Common to chassis.	A6, A7	Adjust for maximum deflection.
8	"	"	"	"	DC probe to Point (C). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7	.01MFD	High side to pin 1 of 6AL5 (V6). Low side to chassis.	4.5MC (450KC swp.)	4.5MC	Any	Vert. amp. to Point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C4. Adjust for curve of maximum amplitude and symmetry as per fig. 2.
8	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A8	Reconnect capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

The tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field. If the tuner is definitely known to be mis-aligned return the entire tuner to the factory.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9	.01MFD	High side to pin 1 (grid) of 6AU6 (V7). Low side to chassis.	4.5MC (unmod.)	Any	DC probe thru crystal diode detector (fig. 4) to pin 11 of picture tube . Common to chassis.	A9	Adjust for MINIMUM deflection.

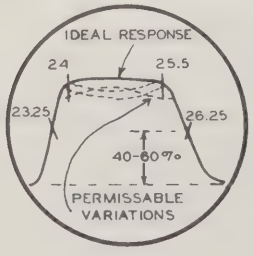


FIG. 1

FIG. 2

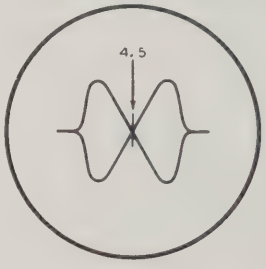


FIG. 3

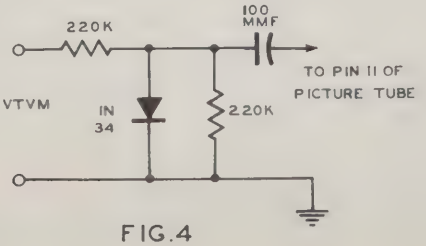
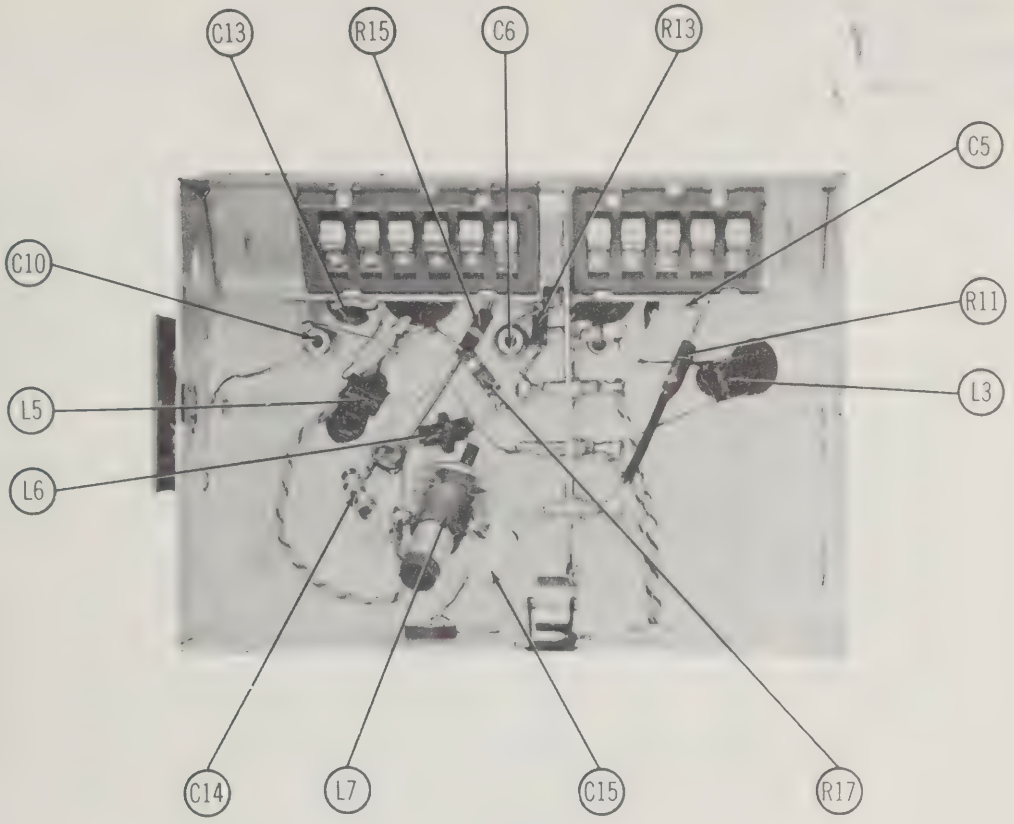
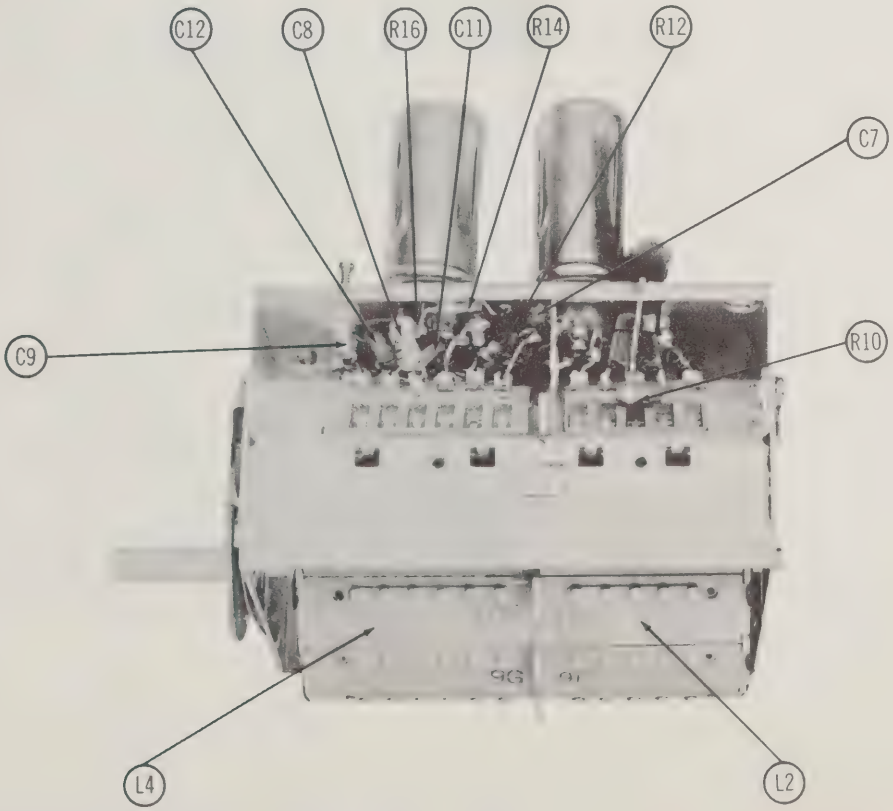


FIG. 4



RF TUNER-BOTTOM VIEW

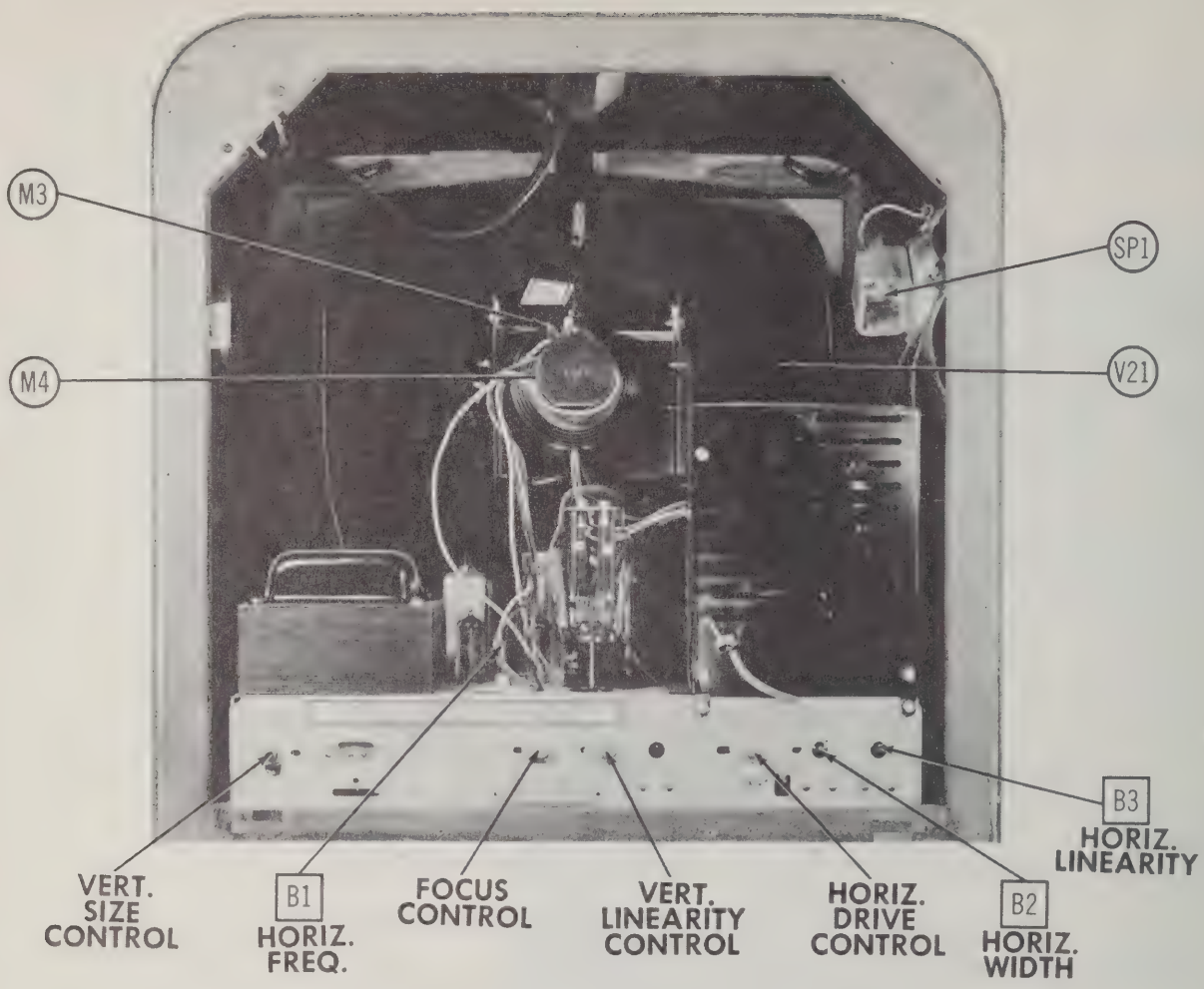


RF TUNER-RIGHT SIDE

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1.7Meg	0Ω	.1Ω	0Ω	†4.9KΩ	†4.9KΩ	0Ω		
V 2	6J6	†7.4KΩ	†2.7KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	1.7Meg	124Ω	0Ω	.1Ω	†2.7KΩ	†2.7KΩ	56Ω		
V 4	6CB6	1.7Meg	124Ω	0Ω	.1Ω	†2.7KΩ	†2.7KΩ	68Ω		
V 5	6CB6	.1Ω	180Ω	0Ω	.1Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 6	6AL5	.1Ω	680KΩ	0Ω	.1Ω	700Ω	0Ω	8.2KΩ		
V 7	6AU6	1Meg	0Ω	0Ω	.1Ω	†6.9KΩ	†2.6KΩ	350Ω		
V 8	6AU6	2.5Meg	44KΩ	0Ω	.1Ω	†24KΩ	†2.6KΩ	44KΩ		
V 9	6AU6	470KΩ	0Ω	0Ω	.1Ω	†3.6KΩ	†3.6KΩ	0Ω		
V 10	6AL5	INF	INF	0Ω	.1Ω	4.7KΩ	0Ω	4.7KΩ		
V 11	6AT6	6.8Meg	0Ω	0Ω	.1Ω	INF	INF	†270KΩ		
V 12	6V6GT	INF	.1Ω	†1.3KΩ	†1.1KΩ	470KΩ	740KΩ	0Ω	390Ω	
V 13	6SN7GT	†2.2Meg	†10KΩ	2.2KΩ	1.5Meg	#950KΩ	0Ω	0Ω	.1Ω	
V 14	6V6GT	INF	.1Ω	#7.2KΩ	#7.2KΩ	2.2Meg	INF	0Ω	1.8KΩ	
V 15	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	12KΩ	0Ω	12KΩ		
V 16	6SN7GT	5.1Meg	#13KΩ	1.5KΩ	130KΩ	#190KΩ	1.5KΩ	0Ω	.1Ω	TOP CAP #10Ω
V 17	6BQ6GT	†12KΩ	0Ω	INF	†12.6KΩ	470KΩ	470KΩ	.1Ω	100Ω	
V 18	6W4GT	INF	INF	250KΩ	INF	†118Ω	INF	#11Ω	#11Ω	TOP CAP #226Ω
V 19	1B3GT	PINS 1 THRU 8 HAVE INF RESISTANCE								
V 20	5U4G	INF	50KΩ	INF	41Ω	INF	38Ω	INF	50KΩ	
V 21	17KP4	.1Ω	44KΩ	PIN 6 150KΩ	PIN 10 #9.2KΩ	PIN 11 160KΩ	PIN 12 0Ω			

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V20
# MEASURED FROM PIN 3 OF V18



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the mid-point of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Turn the horizontal drive control to the maximum clockwise rotation without compression of the center of the picture.

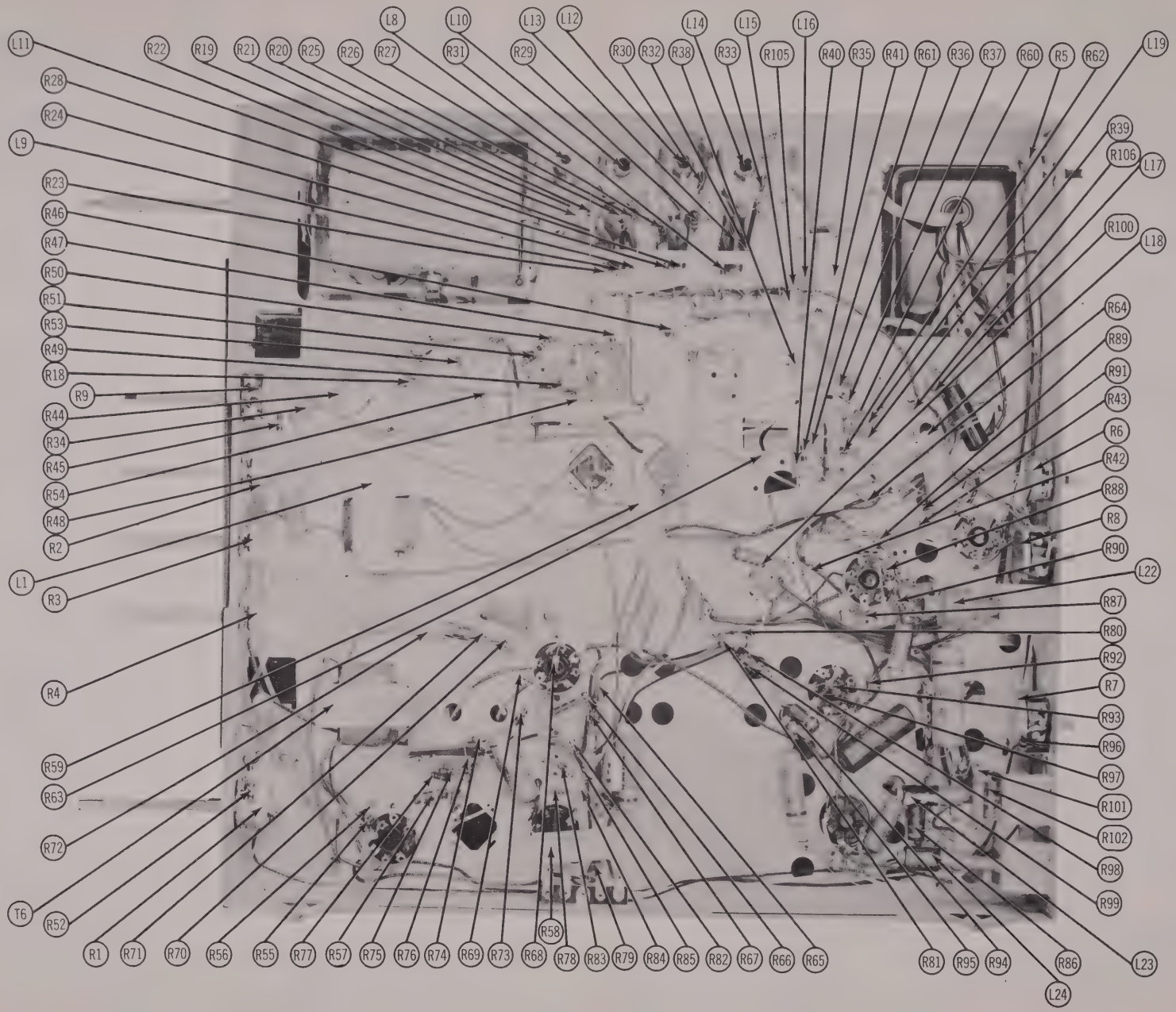
Adjust the width slug (B2) for a picture slightly wider than enough to fill the picture mask.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 11 wood screws and remove rear cover.
3. Disconnect built-in antenna and speaker leads.
4. Remove 2 nuts holding speaker. Remove speaker.
5. Remove 2 wood screws. Remove antenna bracket.
6. Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CH	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CH	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CH	
V6	Video Detector - AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Output	6AU6	6AU6	7BK	
V8	Sync Seperator - DC Restorer	6AU6	6AU6	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6AT6	6AT6	7BT	
V12	Audio Output	6V6GT	6V6GT	7AC	
V13	Sync Phase Inv- Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V14	Vert. Output	6V6GT	6V6GT	7AC	
V15	Horiz. Phase Det.	6AL5	6AL5	6BT	
V16	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	R.V. Rectifier	1B3GT	1B3GT	3C	
V20	L.V. Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
21A	17KP4			12C	
B	17BP4			12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475	PA4307-13	AFH2-72		UP4450		TVL-2830	▲ Filter
B	40	475							▲ Filter
C2A	40	450	PA4307-29	AFH4-84		UPT44145-V2		TVL-4736	▲ Filter
B	10	350							▲ Audio Output Dec.
C	40	400							▲ Audio Output Screen
D	30	25							Audio Output Cathode
C3A	20	450	PA4307-30	AFH4-80		UP2250		TVL-4809	▲ Horiz. MV Cathode
B	20	450				BRH501			▲ Vert. Output Dec.
C	100	50							▲ Vert. Output Cathode
C4	5	50	PA4308-2	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C5	3-9				829-10				Variable Trimmer
C6	.5-3				829-3				Variable Trimmer
C7	120			5I120	D6-121	TM5T12	GP2K-121	5GA-T12	RF Amp. Dec.
C8	100			5I100	D6-101	TM5T1	GP1K-101	5GA-T1	RF Coupling
C9	.5-3				829-3				Variable Trimmer
C10	.5-3				829-3				Variable Trimmer
C11	30			5I20N P0	TCZ-20		NP0K-200	5TCC-Q2	Osc. Grid. Cap.
C12	10			5I10N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C13	1000			BPD-001	D2-102	TM5D1	801-001	5HK-D1	Conv. Fil. Bypass
C14	10			5I10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C15	120			5I120	D6-121	TM5T12	GP2K-121	5GA-T12	IF Coupling
C16	3.3		PA4326-4	5I3.3NP0	TCZ-3.3		NP0K-3R3	5TCCB-V33	IF Coupling
C17	100		PA4332-3	5I100NP0	TCZ-101		NP0-333-101	5TCC-T1	Fixed Trimmer
C18	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C19	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Dec.
C20	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Cathode
C21	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Fil.
C22	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C23	270			HK36M-271	D6-271		GP2K-271	5GA-T27	IF Coupling
C24	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C25	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Dec.
C26	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Cathode
C27	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Fil.
C28	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Dec.
C29	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Cathode
C30	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Fil.
C31	100		HK36M-101	5I100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C32	.1	200	PC40GK-104	P288-1	DF-104	P2P1		2TM-P1	AGC Filter
C33	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Video Det.-AGC Rect. Fil.
C34	.01	400	PC40GL-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	AGC Rect. Cathode
C35	4.7		PA4328-11		SI4. 7NP0	TCZ-4.7	NP0K-4R7	5TCCB-V47	Video Det. Filter
C36	4.7		PA4328-11		SI4. 7NP0	TCZ-4.7	NP0K-4R7	5TCCB-V47	Fixed Trimmer
C37	.1	200	PC40HK-104	P288-1	DF-104	P2P1		2TM-P1	Video Coupling
C38	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Video Amp. Cathode
C39	470	500	MC80F-471	1468-0005	D8-471	5W5T5	GP2K-471	1FM-35	RF Bypass
C40	47		CC30A-470F		TCZ-47		NP0K-470	5TCC-Q47	Fixed Trimmer
C41	.1	400	PC40HL-104	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C42	.1	200	PC40HK-104	P288-1	DF-104	P2P1		2TM-P1	Picture Tube Cathode
C43	2.2		PA4325-1		SI2. 2NP0	TCZ-2.2	NP0K-2R2	5TCCB-V22	Sound IF Coupling
C44	33	500	MC60E-330	SI33	D8-330		GP1K-330	5GA-Q33	Sound IF Grid Cap.
C45	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Dec.
C46	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Diode Load Cap.
C47	1000		HK36M-102	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	De-Emphasis
C48	.02	400	PC40EL-203	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C49	.03	200	PC40GK-303	P488-03		PTE6S3		6TM-S3	Tone Compensation
C50	.01	400	PC40HL-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C51	.02	600	PC40HM-203	P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C52	.001	600	PC40GM-102	P688-001	D8-102	PTE6D1	GP2L-102	6TM-D1	Audio Output Grid
C53	68	500	MC60E-680	1469-00007	D6-680	5W5Q7	GP1K-680	MS-47	Tone Compensation
C54	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		4TM-S5	Sync Coupling
C55	150	500	MC60F-151	1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	Sync Coupling
C56	.25	200	PC40HK-254	P488-25		P2P25		2TM-P25	Sync Sep. Cathode
C57	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		4TM-P1	Sync Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE, PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58A	.002								
B	.005		PA4339-4	P688-002	D6-202	PTE6D2	GP2-333-202	34C17	Vert. Integrator Net.
C	.005			P688-005	D6-502	PTE6D5	GP2-333-502		
C59	4700	500	MC81F-472	1464-005		1DR5D5		MS-25	Vert. Osc. Grid Cap.
C60	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C61	2000	500	MC61E-202	1464-002		1R5D2		MS-22	Vert. Osc. Plate
C62	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		4TM-S5	Vert. Discharge
C63	.1	400	PR40GL-104	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C64	.1	200	PC42GK-104	P288-1	DF-104	PT3P1		2TM-P1	Fixed Trimmer
C65	1000	500	MC81E-102	1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Sync Coupling
C66	1000	500	MC81E-102	1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Sync. Coupling
C67	.01	400	PC40FL-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Voltage Divider
C68	5100	500	MC61E-512						Horiz. AFC Coupling
C69	.1	200	PC40FK-104	P288-1	DF-104	PT2P1		2TM-P1	Horiz. AFC Filter
C70	3300	500	MC63F-332						Fixed Trimmer
C71	270	500	MC60E-271	1469-0003		5R5T3		MS-33	Horiz. MV Feedback
C72	270	500	MC60E-271	1469-0003		5R5T3		MS-33	Horiz. MV Plate
C73	270	500	MC60E-271	1469-0003		5R5T3		MS-33	Horiz. Discharge
C74	.01	400	PC40GL-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz. Sweep Coupling
C75	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		4TM-S5	Horiz. Output Screen
C76	.47	200	PC42GK-474	P288-47		PT2P5		2TM-P47	Horiz. Output Cathode
C77	1800	500	MC61E-182						Fixed Trimmer
C78	.05	400	PC40GL-503	P488-05		DF-503		4TM-S5	Damper Filter
C79	.05	400	PC40GL-503	P488-05		DF-503		4TM-S5	Damper Filter
C80	.25	400	PC40GL-254	P488-25		PTE4P25		4TM-P25	Horiz. Sweep Coupling
C81	500	20000	PA4342-2	HY20C	TV3-502	MM-C20T5	413-501	20DK-T5	H V Filter
C82	.047	600	PA4346-1	682ZGXY-05		PJ685		6TM-S47	Line Filter
C83	120		PA4332-4		TCZ-121		NP0-333-121	5TCC-T12	Fixed Trimmer
C84	.003	600	PC40GM-302	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Vert. Sweep Coupling - See Note 1

Note 1. Not used in all models

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	330KΩ	½	PA4436-3	QI8-132X	AK-69		Volume Control - Tapped ② 60KΩ
B	Shaft		Not Req.	Not Req.	KS8-3		Attach to R1A per instructions
C	Switch		Not Req.	SWB	T6-1		Attach to R1A per instructions
R2A	100KΩ	½	PA4445-2	QI1-128	AG-49-S	B-40	Brightness Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R2A per instructions
R3A	50KΩ	½	PA4444-2	QI1-123	AG-44-S	B-31	Horizontal Hold Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R3A per instructions
R4A	1Meg	½	PA4443-2	QI1-137	AG-61-S	B-69	Vertical Hold Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R4A per instructions
R5A	2.5Meg	½	PA4431	QI1-239	AG-84-S	AB-83	Vert. Size Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	500KΩ	½	PA4452	QI1-133	AG-58-S	AB-59	Focus Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	1000Ω	2	PA4446	WK-1000	A43-1000	VK-129	Horizontal Drive Control - Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R7A per instructions
R8A	5000Ω	2	PA4411	W-5000	A43-5000	VK-135	Vertical Linearity Control - Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R8A per instructions
R9A	100	2	PA4453	WK-1000	A43-1000	V-129	Contrast control-wirewound
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R9A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R10	3900Ω	½		BTS-3900	Antenna Coil Shunt
R11	47KΩ 20%	½		BTS-47K	RF Amp. Grid
R12	10KΩ	½		BTS-10K	RF Coil Shunt
R13	2200Ω 20%	½		BTS-2200	RF Amp. Decoupling
R14	4700Ω	½		BTS-4700	Mixer Grid
R15	220KΩ 20%	½		BTS-220K	Mixer Grid
R16	10KΩ	½		BTS-10K	Oscillator Grid
R17	4700Ω	½		BTS-4700	Osc. Plate
R18	100Ω 20%	½		BTS-100	Decoupling
R19	3900Ω 5%	½		BTS-3900 5%	1st. Video IF Amp. Grid
R20	1000Ω 20%	½		BTS-1000	AGC Network
R21	68Ω 5%	½			1st. Video IF Amp. Cathode
R22	56Ω 5%	½			1st. Video IF Amp. Cathode
R23	100Ω 20%	½		BTS-100	1st. Video IF Amp. Decoupling
R24	1000Ω 20%	½		BTS-1000	AGC Network
R25	18KΩ 5%	½		BTS-18K 5%	2nd. Video IF Amp. Grid
R26	56Ω 5%	½			2nd. Video IF Amp. Cathode
R27	68Ω 5%	½			2nd. Video IF Amp. Cathode
R28	100Ω 20%	½		BTS-100	2nd. Video IF Amp. Decoupling
R29	4300Ω 5%	½		BTS-4300 5%	3rd. Video IF Coil Shunt
R30	180Ω	½		BTS-180	3rd. Video IF Amp. Cathode
R31	100Ω 20%	½		BTS-100	3rd. Video IF Amp. Decoupling
R32	1Meg 20%	½		BTS-1Meg	AGC Network
R33	680KΩ 20%	½		BTS-680K	AGC Rectifier Diode Load
R34	82KΩ	2		BTB-82K	Voltage Divider
R35	8200Ω 5%	½		BTS-8200 5%	Video Det. Diode Load
R36	1Meg	½		BTS-1Meg	Video Output Grid
R37	68Ω	½			Video Output Cathode
R38	180Ω 5%	½		BTS-180 5%	Contrast Control Shunt
R39	12KΩ 5%	½		BTS-12K 5%	Video Peaking Coil Shunt
R40	6800Ω 5%	1		BTA-6800 5%	Video Output Plate
R41	10KΩ	½		BTS-10K	Isolation
R42	1000Ω 20%	½		BTS-1000	ACC Anode Load
R43	100KΩ	½		BTS-100K	Picture Tube Cathode
R44	180KΩ	½		BTS-180K	Voltage Divider
R45	10KΩ	½		BTS-10K	Voltage Divider
R46	470KΩ	½			Sound IF Amp. Grid
R47	1000Ω 20%	½		BTS-1000	Sound IF Amp. Decoupling
R48	180Ω 5%	½		BTS-180 5%	Balancing
R49	47KΩ	½		BTS-47K	De-emphasis
R50	4700Ω 5%	½		BTS-4700 5%	Ratio Det. Diode Load
R51	4700Ω 5%	½		BTS-4700 5%	Ratio Det. Diode Load
R52	10KΩ	½		BTS-10K	Tone Compensation

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES
R53	6.8Meg 20%	½		BTS-6.8Meg	AF Amp. Grid
R54	270KΩ	½		BTS-270K	AF Amp. Plate
R55	270KΩ	½		BTS-270K	Feedback Network
R56	470KΩ 20%	½		BTS-470K	Output Grid
R57	390Ω	1		BTA-390	Output Cathode
R58	1000Ω	10		1 3/4A-1000	Voltage Divider - Wire Wound
R59	1500Ω	10		1 3/4A-1500	Voltage Divider - Wire Wound
R60	270KΩ	½		BTS-270K	Isolation
R61	2.2Meg 20%	½		BTS-2.2Meg	Sync. Separator Grid
R62	22KΩ	½		BTS-22K	Sync Separator Cathode
R63	22KΩ	½		BTS-22K	Sync Separator Cathode
R64	22KΩ	½		BTS-22K	Sync Separator Plate
R65	2.2Meg 20%	½		BTS-2.2Meg	Sync Phase Inv. Grid
R66	4700Ω 5%	½		BTS-4700 5%	Sync Phase Inv. Plate
R67	3300Ω 5%	½		BTS-3300 5%	Sync Phase Inv. Plate
R68	2200Ω 5%	½		BTS-2200 5%	Sync Phase Inv. Cathode
R69	68KΩ	½		BTS-68K	Integrator Network
R70	8200Ω	½		BTS-8200	Integrator Network
R71	8200Ω	½		BTS-8200	Integrator Network
R72	1.1Meg 5%	½		BTS-1.1Meg 5%	Vert. Osc. Grid
R73	100KΩ	½		BTS-100K	Vert. Osc. Transformer Shunt
R74	100KΩ	½		BTS-100K	Vert. Osc. Plate
R75	100KΩ	½		BTS-100K	Voltage Divider
R76	6.8Meg	½		BTS-6.8Meg	Voltage Divider
R77	8200Ω	½		BTS-8200	Vert. Peaking
R78	2.2Meg 20%	½		BTS-2.2Meg	Vert. Output Grid
R79	1000Ω	1		BTA-1000	Vert. Output Cathode
R80	20KΩ 5%	1		BTA-20K 5%	Decoupling
R81	10KΩ	2		BTB-10K	Decoupling
R82	100KΩ	½		BTS-100K	Horiz. Phase Det. Diode Load
R83	100KΩ	½		BTS-100K	Horiz. Phase Det. Diode Load
R84	4.7Meg 20%	½		BTS-4.7Meg	Horiz. Phase Det. Diode Load
R85	470KΩ	½		BTS-470K	Horiz. AFC Filter
R86	12KΩ	2		BTB-12K	Horiz. Feedback
R87	1500Ω 5%	½		BTS-1500 5%	Horiz. MV Cathode
R88	4700Ω 5%	½		BTS-4700 5%	Horiz. MV Plate
R89	100KΩ	½		BTS-100K	Horiz. MV Grid
R90	180KΩ 5%	½		BTS-180K 5%	Horiz. MV Plate
R91	10KΩ	½		BTS-10K	Horiz. Peaking
R92	100Ω 20%	½			Parasitic suppressor
R93	470KΩ	½		BTS-470K	Horiz. Output Grid
R94	150Ω	2			Horiz. Output Cathode
R95	300Ω 5%	1		BTA-300 5%	Horiz. Output Cathode
R96	39Ω	½			Horiz. Peaking
R97	470Ω 20%	½			Parasitic Suppressor
R98	18KΩ	2		BTB-18K	Horiz. Output Screen
R99	36KΩ 5%	1		BTA-36K 5%	Horiz. Output Screen
R100	8200Ω	2		BTB-8200	Decoupling
R101	5600Ω	2		BTB-5600	Width Control Shunt
R102	12KΩ	1		BTA-12K	Width Control Shunt
R103	3.3Ω	½			H.V. Rectifier Filament - Wire Wound
R104	1Meg 20%	1			H.V. Filter
R105	47KΩ	½		BTS-47K	Video Peaking Coil Shunt
R106	12KΩ	½		BTS-12K	Video Peaking Coil Shunt
R107	330KΩ	½		BTS-330K	Picture Tube Grid - See Note

Note. Not used in all Models

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ② 1.74A	680VCT .240AUC	6.3VAC ② 7.4A	6.3VAC ② 1.15A SEC. 4 5VAC ② 3A	AB-44027-1		P-3059	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	150Ω	820Ω	AB47008-4	A-8111	A-3000	TB0-3	Vert. Osc. Trans.
T3	245Ω Tap ② 7Ω, 17Ω, 18.7Ω	3.9Ω SEC. 2 0Ω	PC-70015B PC-70015 ②				Horiz. Output Trans.
T4	28.7Ω, 35.4Ω 670Ω	6.2Ω	AB-44062-5	A-8115 ①	A-3035 ①	TS0-1 ①	Vert. Output Trans.
T5A	16Ω		PC-70016-1	DY-8	MDF-70	TY-2	Horiz. Deflection Yoke
B	60Ω		PC-70016 ③				Vert. Deflection Yoke

① Drill one new mtg hole
② Alternate horiz. output trans.
③ Alternate deflection yoke

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	6.4KΩ	3.4Ω	270Ω	.4Ω	AB-44066-3	A-3823	A-3020	RO-303	

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SPARTON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"	PM	3.3Ω	PC-63000-43	ST-108 Mod. P6-X	6A1	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∽)	SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.220ADC	110Ω	6 Hy.	AB47009-1	C-2327	C-2994	R-7200	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SPARTON PART No.	MERIT PART No.	
L2	Ant. Coils	0Ω				
L3	Fil. Choke	0Ω				
L4	RF, Mixer Grid and Osc. Coils	0Ω				
L5	Fil. Choke	0Ω				
L6	RF Choke	2.8Ω				
L7	1st. Video IF	.8Ω				
L8	21.75MC Trap	0Ω		AB43523-14		
L9	Fil. Choke	0Ω		AA6651-1		
L10	2nd. Video IF	.1Ω		AA6408-1	TV-102	
L11	Fil. Choke	0Ω		AA6651-1		
L12	3rd. Video IF	.1Ω	.1Ω	AA6409-1		
L13	Fil. Choke	0Ω		AA6651-1		
L14	4th. Video IF	.1Ω	.1Ω	AA6409-1		
L15	Peaking Coil	10Ω		AA6613-4	TV-184	200 Microhenries
L16	Peaking Coil	18Ω		AA6613-8	TV-188	600 Microhenries
L17	Peaking Coil	9.2Ω		AA6613-9	TV-184	175 Microhenries
L18	4.5MC Trap	1.8Ω		AA6407-1	TV-151	
L19	Peaking Coil	18Ω		AA6613-8	TV-188	600 Microhenries
L20	Sound IF	6Ω		AA6667-6		Tap @ 3Ω
L21	Ratio Det.	4.7Ω	1Ω CT.	AA6684-4		Tertiary Winding .5Ω
L22	Horiz. Osc.	75Ω		AA6410-1	TV-163	
L23	Width Coil	5Ω		AA6400-4	MWC-2	
L24	Horiz. Lin.	8Ω		AA6400-5		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SPARTON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	GJV	1/4A. 250V.	PA4212-1		318.250 (3AG-P/T)		GJV1/4	

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M2	RF Tuner	PD93157	
M3	Centering Magnet		
M4	Ion Trap	PA1248-4	
	Cover	AB43582-1	Infrequent Controls
	Knob	PA5651	Infrequent Controls (Brightness, Contrast, Vert. & Horiz. Hold)
	Knob	AA6392-1	Off/On - Volume & Ring Assembly
	Knob	PB40332	Channel Selector
	Knob	PB40346	Fine Tuning
	Knob	PB40351	Focus

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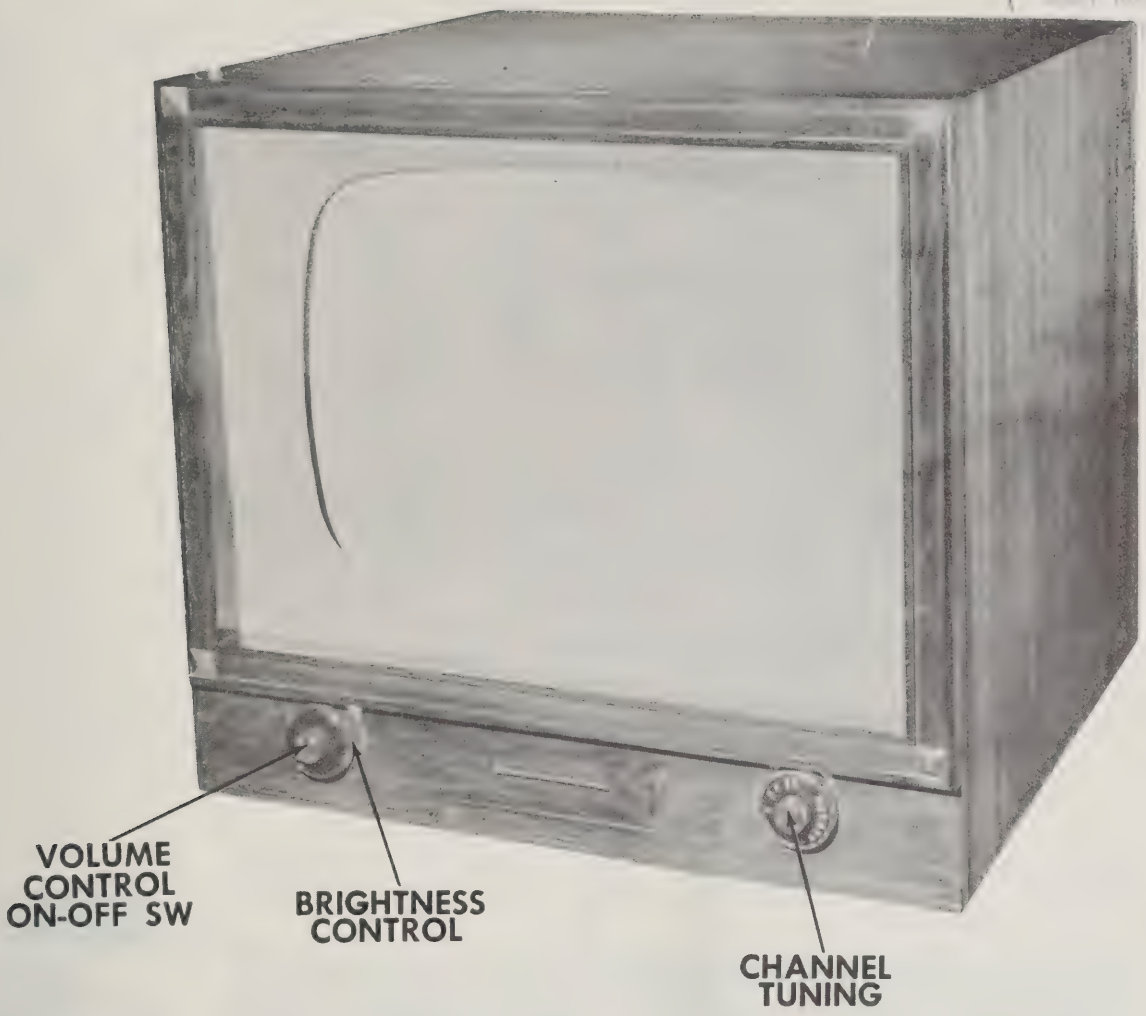

SYLVANIA MODELS 22B-11, 22M-11, 23B-11, 23M-11 (Ch. 1-507-1)

Sylvania 22M-11

TRADE NAME	Sylvania Models 22B-11, 22M-11, 23B-11, 23M-11 (Ch. 1-507-1)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tel. Div., 1292 Niagara St., Buffalo, New York
TYPE SET	Television Receiver
TUBES	
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.16 Amp. @ 117 volts AC
TUNING RANGE	Channels 2 thru 13 continuous tuning

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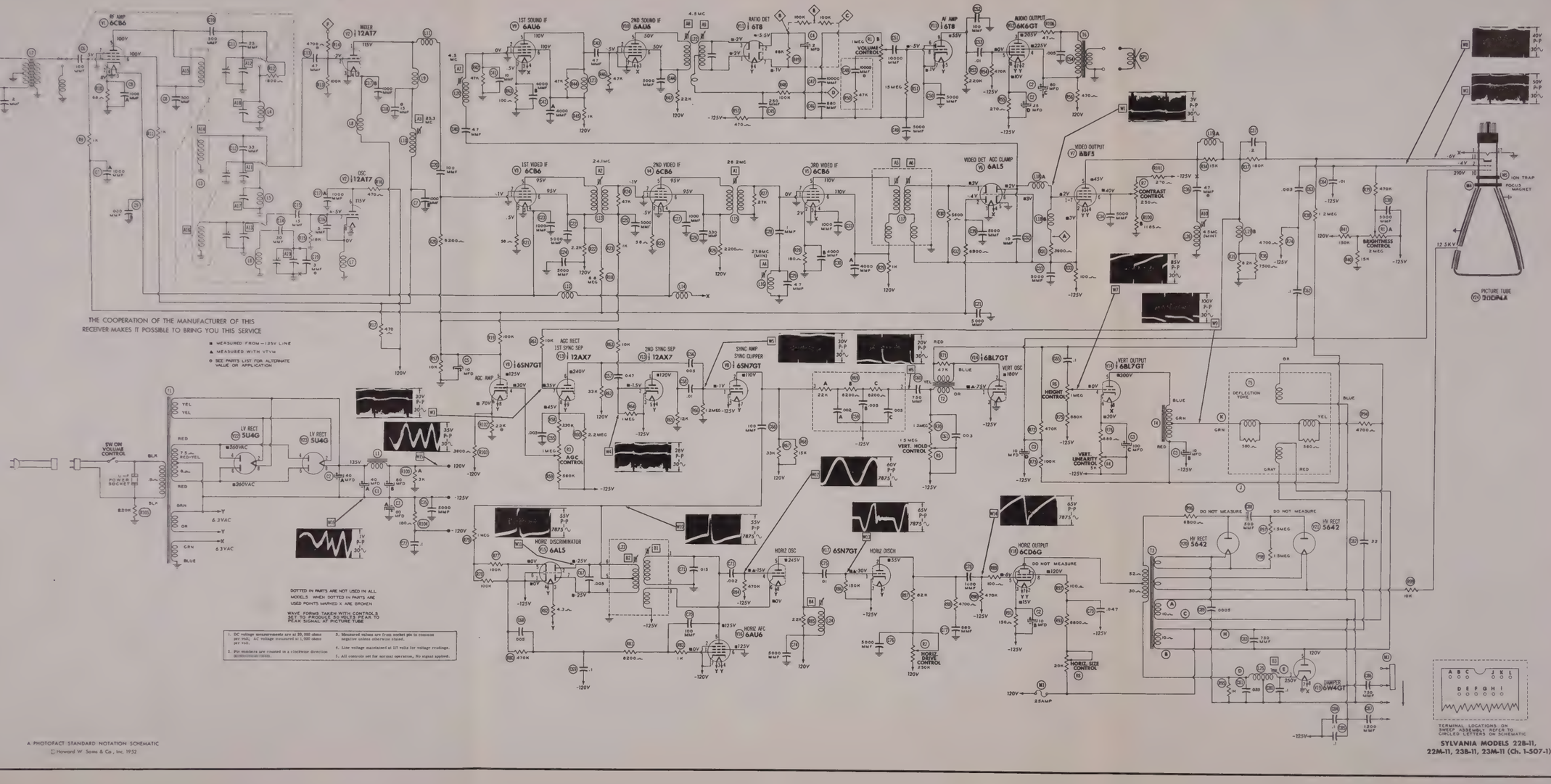
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
■ MEASURED FROM −125V LINE
▲ MEASURED WITH VTVM
◆ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED V. ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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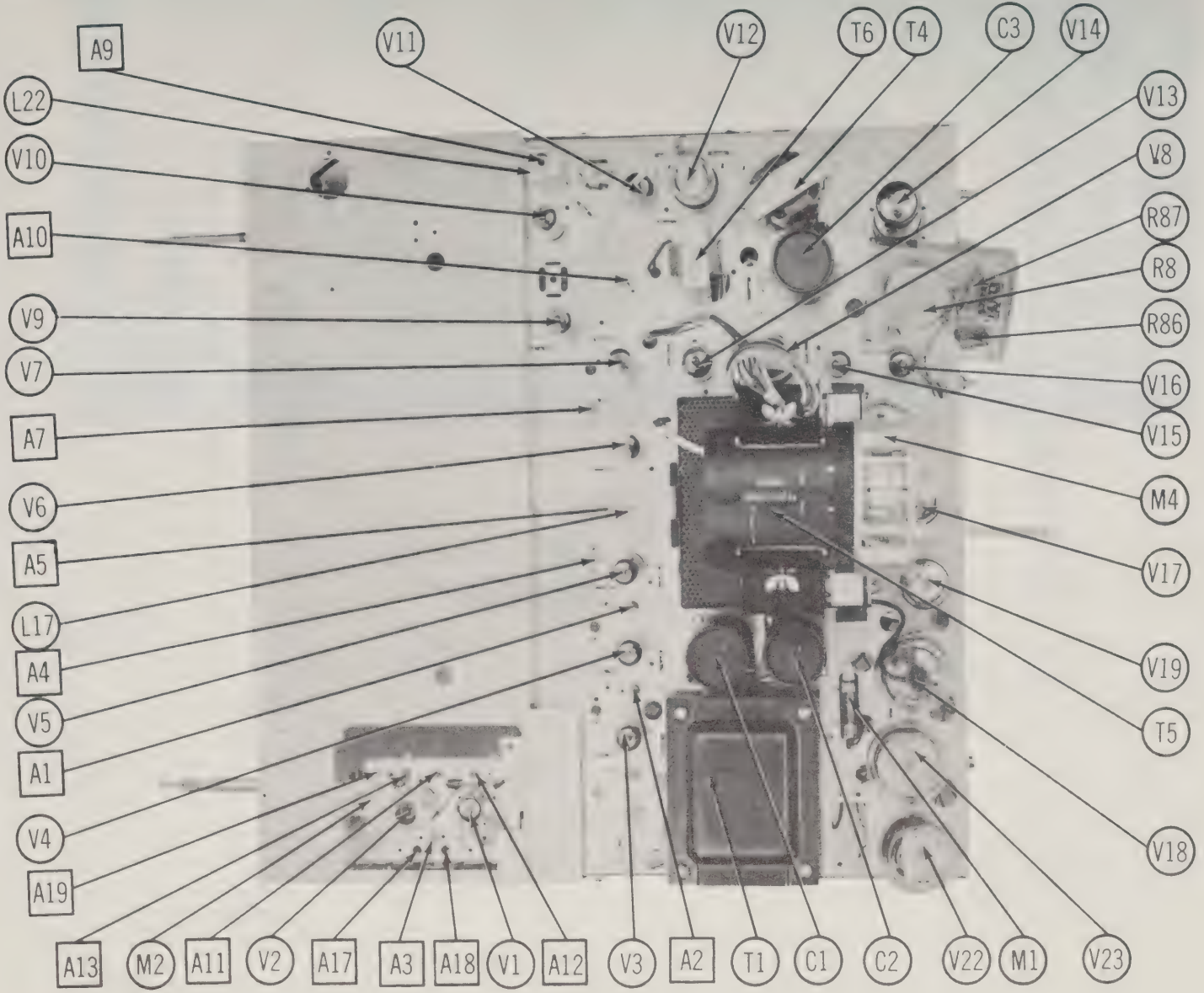
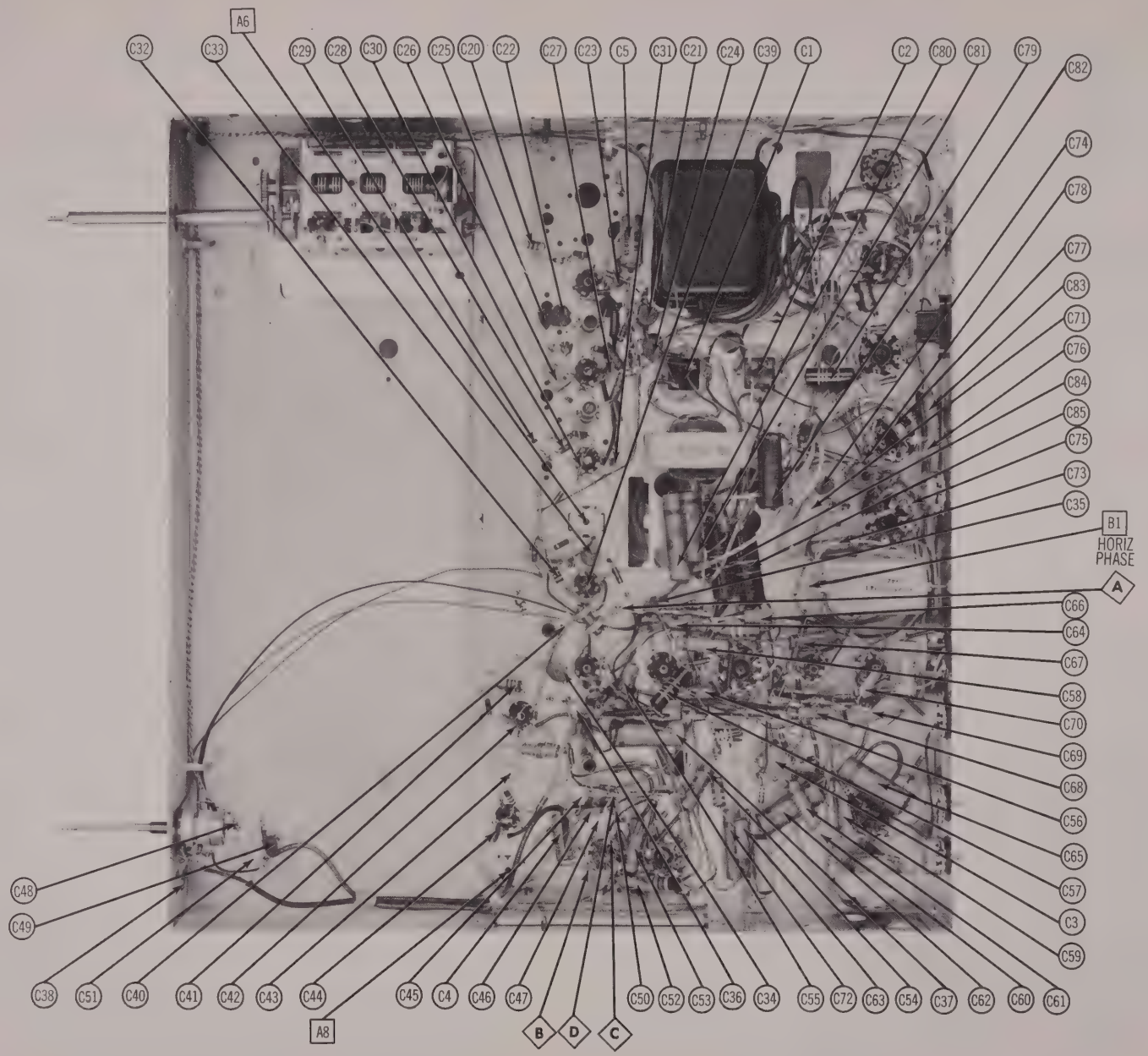
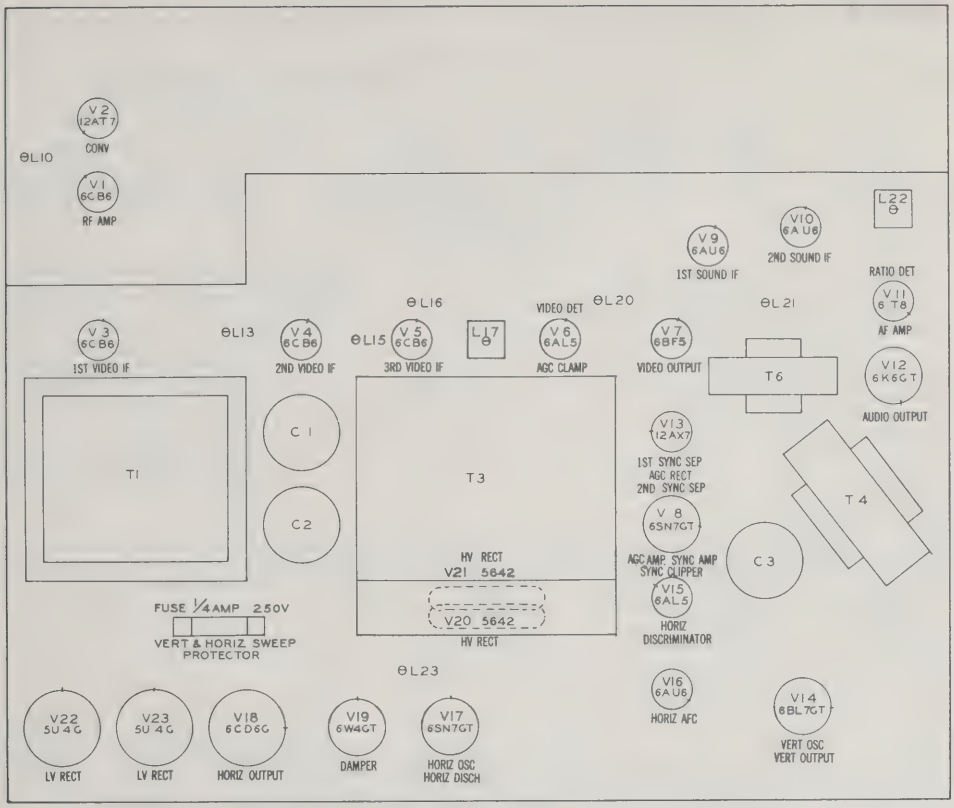
TERMINAL LOCATIONS ON SWEEP ASSEMBLY REFER TO CIRCLED LETTERS ON SCHEMATIC
SYLVANIA MODELS 22B-11, 22M-11, 23B-11, 23M-11 (Ch. 1-507-1)



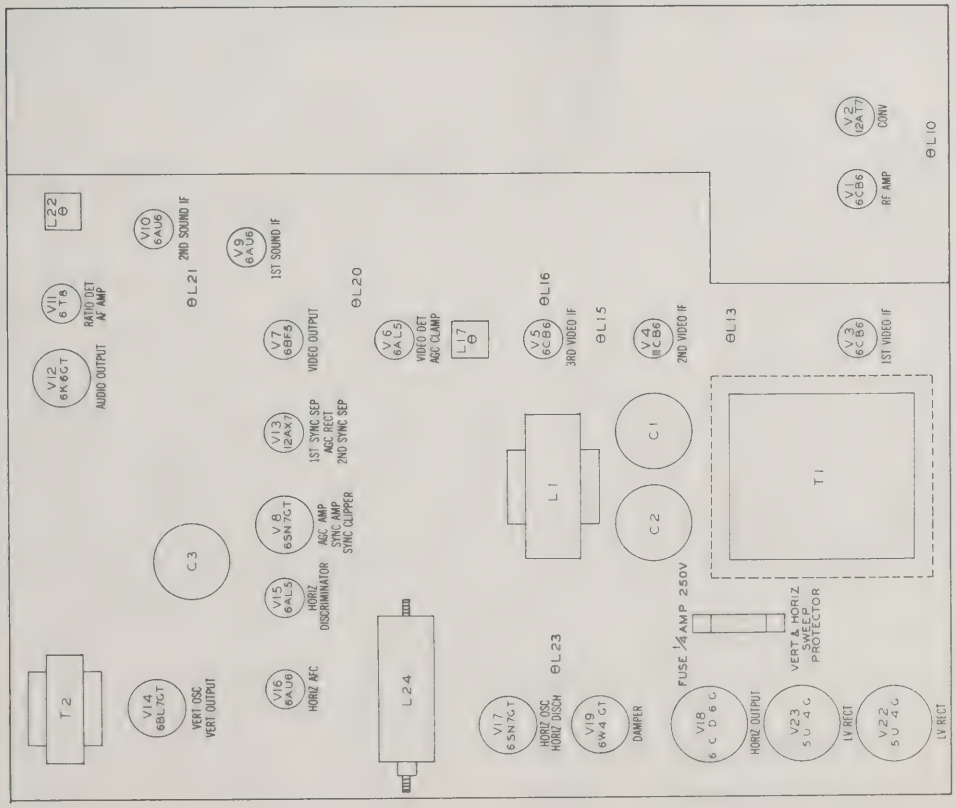
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C5. Connect the positive lead to chassis. During alignment the common lead of the VTVM is connected to a Point approximately -135 volts with respect to chassis. Avoid touching or grounding the case of the VTVM.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	Not used	26.2MC (unmod.)	Tune to point of non-interference.	Use VTVM DC probe to Point (A). Common to pin 2 of 6BF5 (V7).	A1	Adjust for maximum deflection.
2.	"	"	"	24.1MC	"	"	A2	"
3.	"	"	"	25.3MC	"	"	A3	"
4.	"	"	"	27.9MC	"	"	A4	Adjust for MINIMUM deflection.
5.	.005MFD	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	25MC (10MC swp.)	21.9MC 27.0MC	"	Vert. amp. to Point (A). Low side to chassis.	A5, A6	Adjust to obtain response curve similar to fig. 1. If sweep generator output is too low to give a satisfactory indication on scope proceed with step 6.
6.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	"	24MC 26.4MC	"	"		Check for response curve as per fig. 2. If necessary adjust A1, A2, A3, A5 & A6 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ Resistors in series from Point B to Point C. The junction of these two resistors is alignment Point E.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7	.005MFD	High side to pin 1 (cathode) of 6AL5 (V6). Low side to chassis.	4.5MC (unmod.)	Tune to point of non-interference.	DC probe to Point (B). Common to point (C).	A7, A8	Adjust for maximum deflection.
8	"	"	"	"	DC probe to Point (D). Common to Point (E).	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.005MFD	High side to pin 1 (cathode) of 6AL5 (V6). Low side to chassis.	4.5MC (450KC swp)	4.5MC	Tune to point of non-interference.	Vert. amp. to Point (B). Low side to chassis.	A7, A8	Disconnect stabilizer capacitor C4. Adjust for response curve of maximum amplitude and symmetry as per fig. 3.
8.	"	"	"	"	"	Vert. amp. to Point (D). Low side to chassis.	A9	Reconnect capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 4. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ADJUSTMENT

During adjustment of the 4.5MC trap, pin 1 (grid) of 6CB6 (V5) should be grounded to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9	.005MFD	High side to pin 1 (grid) of 6BF5 (V7).	4.5MC (unmod.)	Any	DC probe thru detector(fig. 5) to pin 11 of picture tube. Common to chassis.	A10	Adjust for MINIMUM deflection.

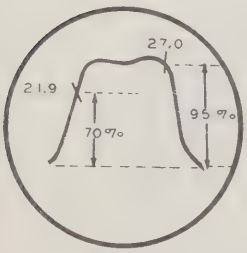


FIG.1

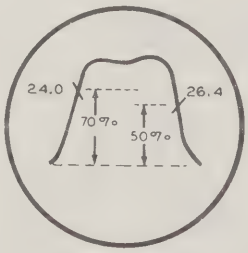


FIG.2

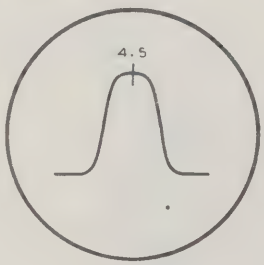


FIG. 3

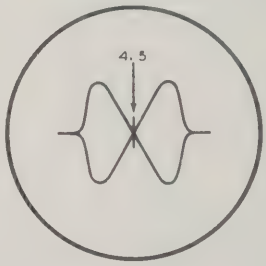


FIG. 4

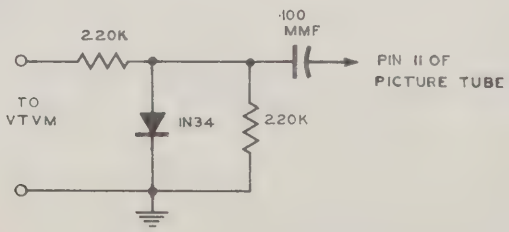


FIG.5

ALIGNMENT INSTRUCTIONS (CONT.)

TUNER ALIGNMENT

Connect the negative lead of a 3 volt battery to the AGC line as under Video IF Alignment.
Two marker generators are required for tuner alignment. If a separate RF marker generator is used it should be coupled through 2 or 3MMF to the antenna terminals.
If the sweep generator is equipped with built in marker it may be used for the RF markers. The other marker generator should be connected through 500MMF to the vertical input of the scope and set at 21.9MC.
During alignment some of the circuits must be loaded temporarily. This can be readily accomplished by touching the specified points with a small metal shank screw driver held in contact with the fingers to furnish the necessary loading capacity.
All alignments must be made with the tuner cover in place. Coils are accessible through holes in the cover.
Remove the 6CB6, V3 during tuner alignment and shunt its grid resistor with 150Ω.
When tuning to a specified channel the correct position may be determined by replacing dial and knob on tuner. The desired channel number should be vertical at top of dial.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

LOW BAND ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC swp.)	83.25MC 87.75MC	6	Vert. amp. to Point (F). Low side to chassis.	A11	Load RF Section of L3 by touching stator plates of rear section of tuning gang and adjust A11 for a single peaked response curve midway between markers as per fig. 6.
11	"	"	"	"	"	"	A12	Load the mixer section of L3 by touching stator plates of second section from rear of tuning gang and adjust A12 for a single peaked response curve midway between markers as per fig. 6.
12	"	"	"	"	"	"	A13	Adjust until the 21.9MC IF marker is almost coincident with the sound marker and both sound and video markers are above 70% of response as per fig. 7.
13	"	"	53MC (10MC swp.)	51.25MC 55.75MC	2	"	A14	Load RF section as in step 10 and compress or expand A14 for a single peaked response curve midway between markers as per fig. 6.
14	"	"	"	"	"	"	A15	Load mixer section as in step 11 and compress or expand A15 for a single peaked response curve midway between markers as per fig. 6.
15	"	"	"	"	"	"	A16	Compress or expand A16 until the 21.9MC IF marker nearly coincides with the sound marker and both sound and video markers are above 70% response as per fig. 7.
16	"	"	"	"	"	"		Adjust the spacing between the RF and mixer sections of L3 so that the dip is 30% below the peaks of response curve as per fig. 7. Repeat complete low band alignment, steps 10 through 16, for best results.

HIGH BAND ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC swp.)	211.25MC 215.75MC	13	Vert. amp. to Point (F). Low side to chassis.	A17	Load the high band RF coil, L4, by touching #7 switch lug (fig. 8) and adjust A17 so that the single peaked response curve falls midway between the sound and video markers as per fig. 6.
18	"	"	"	"	"	"	A18	Load the high band mixer coil, L5 by touching #4 switch lug (fig. 8) and adjust A18 so that the single peaked response curve falls midway between the sound and video markers as per fig. 6.
19	"	"	"	"	"	"	A19	Adjust until the 21.9MC IF marker coincides with the sound marker. If either or both carrier markers fall below 70% response decrease the angle between L4 and L5, fig. 8, for desired marker placement.
20	"	"	177MC (10MC swp.)	175.25MC 179.75MC	7	"	L6	Compress or expand L6 until 21.9MC IF marker and sound marker coincide. Load L4 as in step 17 and bend L5 slightly so that the response curve falls about midway between the RF carrier markers as per fig. 6.
21	"	"	"	"	"	"		Load L5 as in step 18 and adjust L4 for response about midway between RF carrier markers as in step 20.
22	"	"	"	"	"	"	L6	Compress or expand until 21.9MC IF marker and sound marker nearly coincide as per fig. 7. If dip in response curve is more or less than 30% of peak response change angle of mixer coil L5, fig. 8, for desired 30% dip. Repeat steps 17 thru 22 for best results.

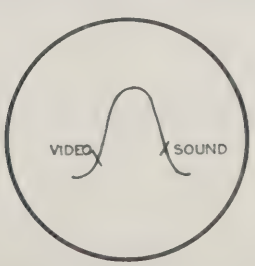


FIG. 6

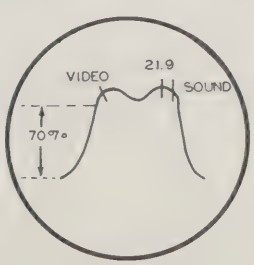


FIG. 7

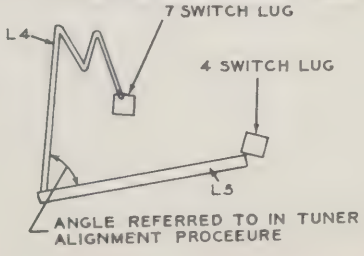
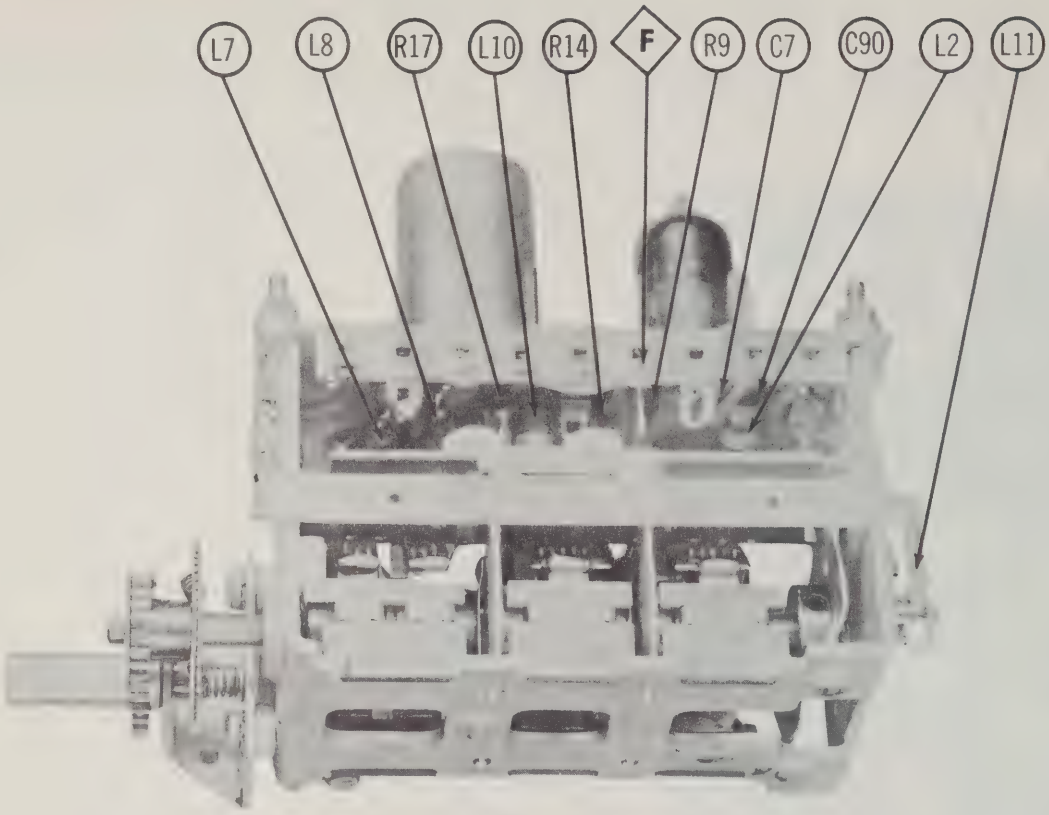


FIG. 8

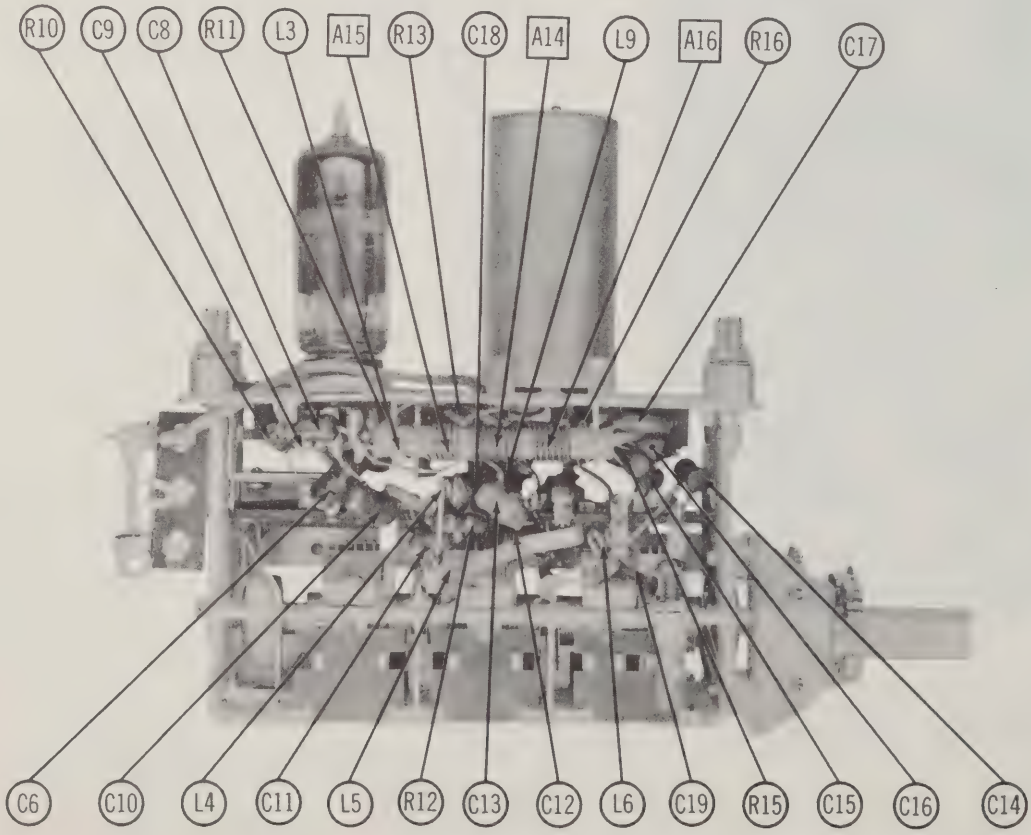
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	110KΩ	68Ω	.1Ω	0Ω	†1.5KΩ	†1.5KΩ	0Ω		
V 2	12AT7	†510Ω	100KΩ	0Ω	0Ω	0Ω	†510Ω	18KΩ	.2Ω	.2Ω
V 3	6CB6	18KΩ	56Ω	0Ω	.1Ω	†2.2KΩ	†2.2KΩ	0Ω		
V 4	6CB6	1KΩ	56Ω	0Ω	.1Ω	†2.2KΩ	†2.2KΩ	0Ω		
V 5	6CB6	.2Ω	180Ω	0Ω	.1Ω	†1KΩ	†1KΩ	0Ω		
V 6	6AL5	■100Ω	120KΩ	.1Ω	0Ω	0Ω	■100Ω	■4KΩ		
V 7	6BF5	■4KΩ	■100Ω	■.1Ω	■0Ω	4KΩ	■350Ω	■4KΩ		
V 8	6SN7GT	1.2Meg	†10KΩ	■0Ω	■1Meg	10KΩ	■2.1KΩ	■.1Ω	■0Ω	
V 9	6AU6	47KΩ	0Ω	0Ω	.1Ω	†1KΩ	†1KΩ	100Ω		
V 10	6AU6	47KΩ	0Ω	.1Ω	0Ω	†22KΩ	†22KΩ	0Ω		
V 11	6T8	INF	■68KΩ	INF	■.1Ω	■0Ω	■470Ω	■470Ω	■15Meg	220KΩ
V 12	6K6GT	INF	■.1Ω	†1.1KΩ	†510Ω	■470KΩ	†1KΩ	■0Ω	■270Ω	
V 13	12AX7	12KΩ	■1Meg	■0Ω	■0Ω	■0Ω	†33KΩ	14KΩ	■1.2Meg	■.1Ω
V 14	6BL7GT	■1.8Meg	#570KΩ	■0Ω	■1.2Meg	#5.6KΩ	■1.4KΩ	0Ω	.1Ω	
V 15	6AL5	■0Ω	■1.1Meg	■2Ω	■.1Ω	■200KΩ	■0Ω	■1.1Meg		
V 16	6AU6	■680KΩ	■180Ω	■.1Ω	■0Ω	39Ω	0Ω	■180Ω		
V 17	6SN7GT	■150KΩ	†240KΩ	■0Ω	■470KΩ	†76Ω	■9.5Ω	■0Ω	■.1Ω	
V 18	6CD6G	†15KΩ	■0Ω	■150Ω	■470KΩ	■470KΩ	INF	■.1Ω	†15KΩ	TOP CAP #37Ω
V 19	6W4GT	■470KΩ	INF	350KΩ	†45Ω	†51Ω	†240KΩ	0Ω	.1Ω	
V 20	5642	Plate #6.9KΩ	Fil. INF	Fil. INF						
V 21	5642	Plate INF	Fil. INF	Fil. INF						
V 22	5U4G	INF	3KΩ	INF	■7.5Ω	INF	■8Ω	INF	3KΩ	
V 23	5U4G	INF	3KΩ	■1Meg	■7.5Ω	INF	■8Ω	■0Ω	3KΩ	
V 24	20DP4A	.1Ω	750KΩ	PIN 10 #100KΩ	PIN 11 160KΩ	PIN 12 0Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PINS 8 OF V22 & V23
■ MEASURED FROM -125VDC LINE
MEASURED FROM PIN 3 OF V19

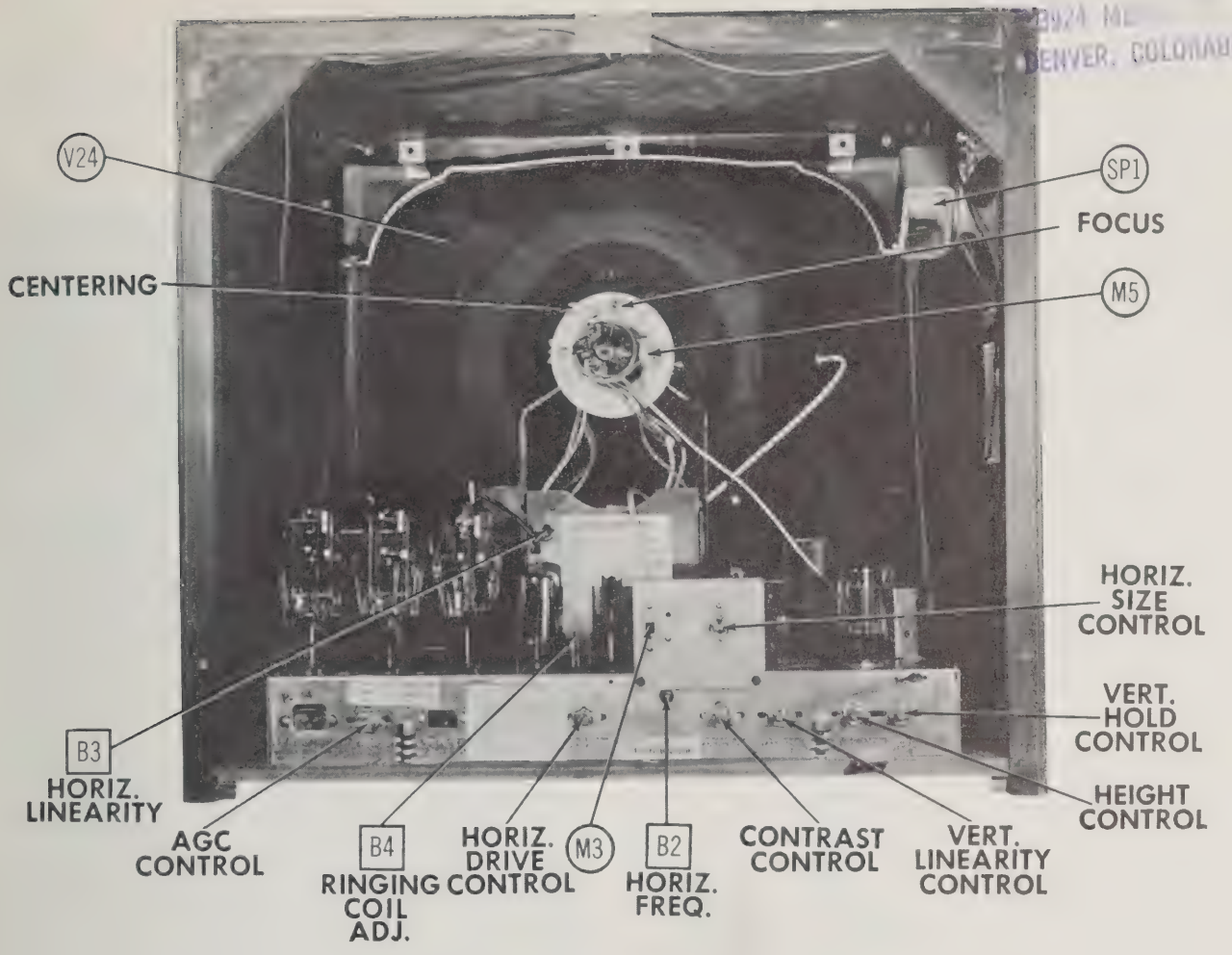


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PRO
L F BU
2924 ME
DENVER, COLORADO

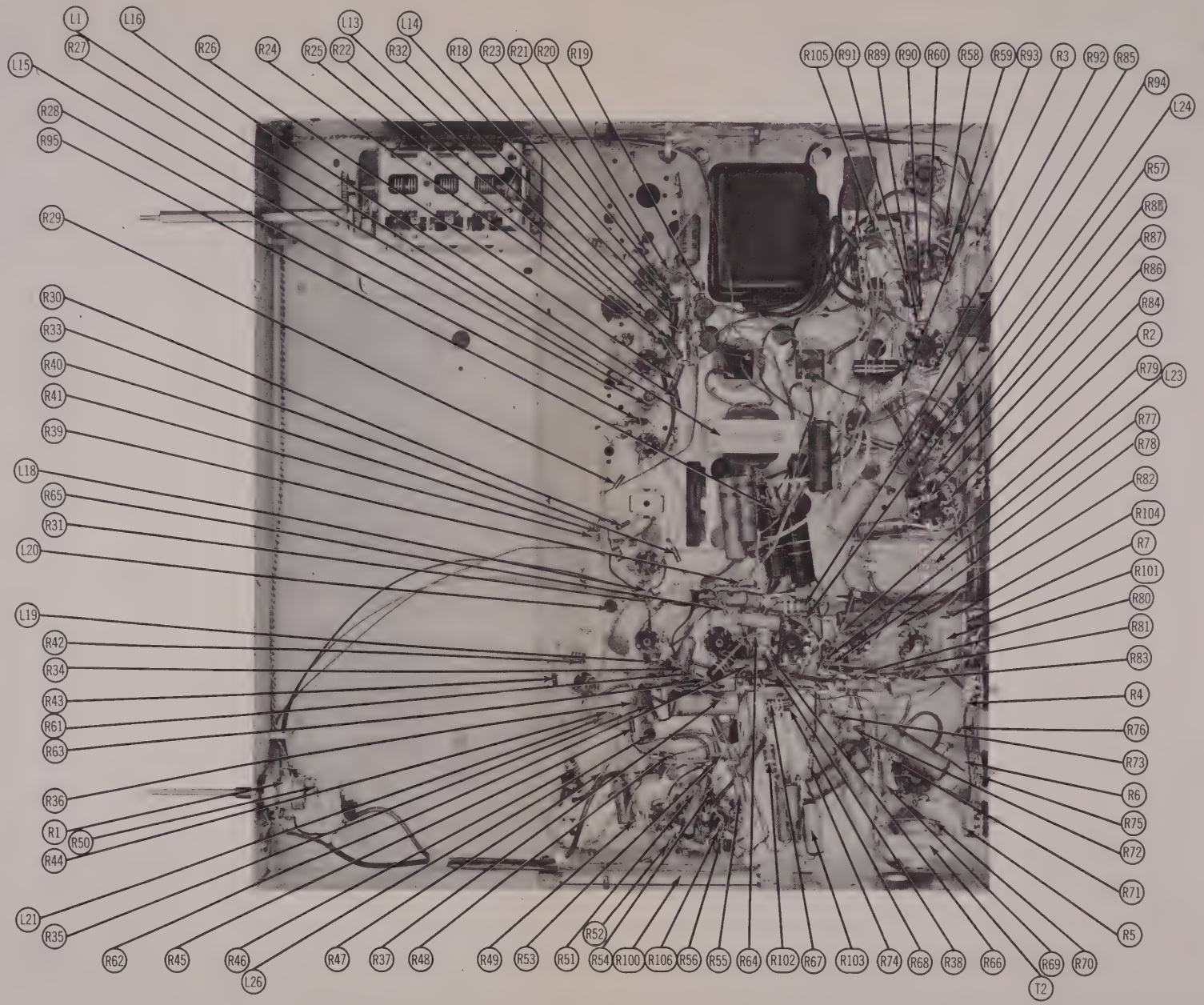


CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

1. Remove 4 Push on type Control Knobs from front panel.
2. Remove 5 wood screws. Remove rear cover.
3. Disconnect Speaker and antenna leads.
4. Remove 2 nuts holding Speaker. Remove Speaker.
5. Remove 7 Chassis Bolts. Remove Chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



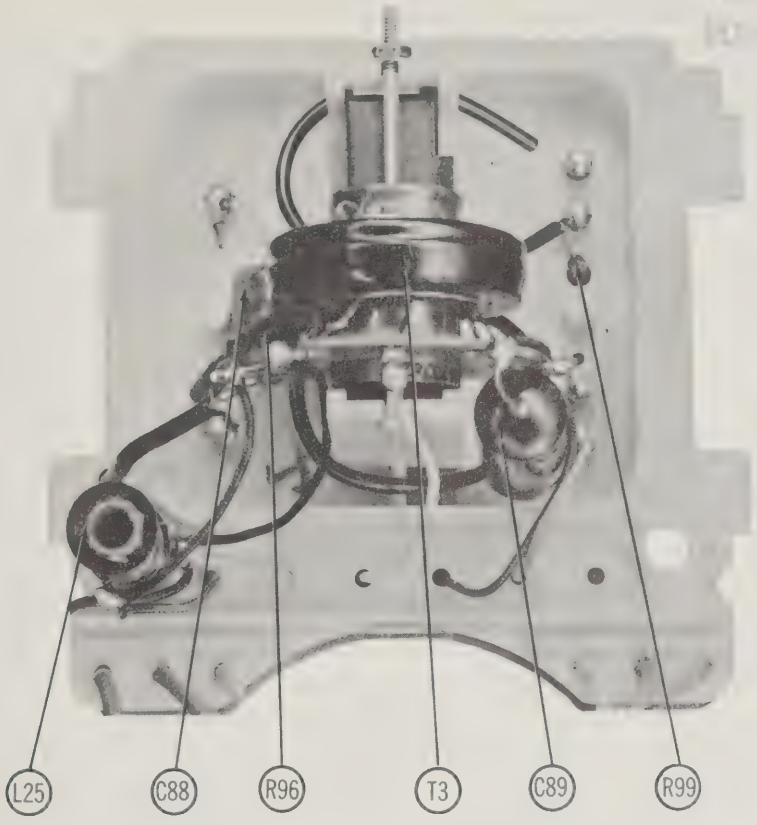
CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

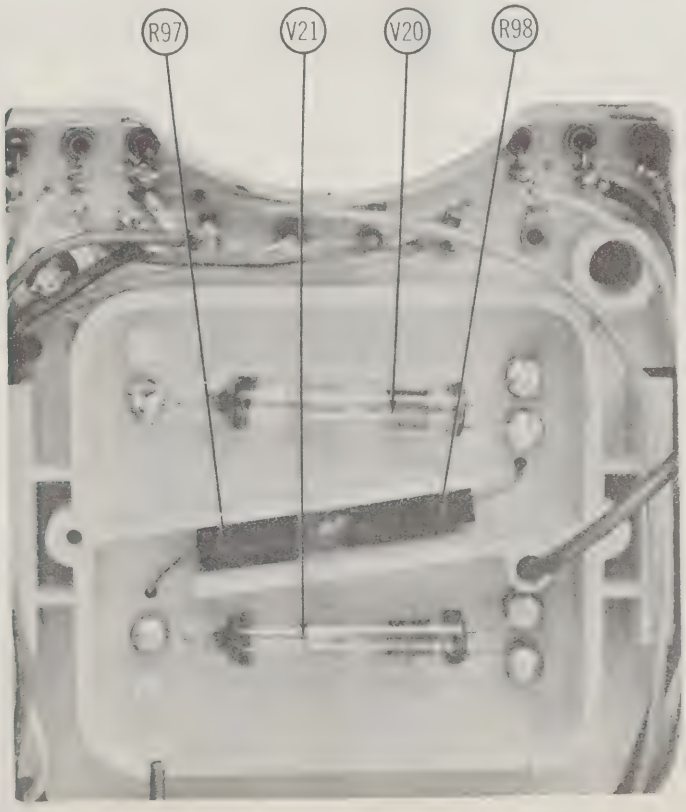
CHECK OF HORIZONTAL SWEEP CIRCUIT OPERATION
Turn the set on and tune in a TV station, preferably a test pattern. Synchronize the picture with the horizontal hold control.
Check the horizontal drive control for maximum clockwise rotation without crowding of center of picture.
Turn to another channel, then back to original channel.
Picture should immediately fall into synchronization.
Switch the receiver off for about five minutes.
When receiver is turned on again picture should sync immediately.
Increase the brightness and decrease the contrast until the normally blanked edges of the raster are visible. There should be approximately 1/8 inch of blanking on the right side of the raster.
If the receiver passes the above checks no horizontal oscillator adjustment is needed.
HORIZONTAL OSCILLATOR ADJUSTMENTS
Turn the core of the "ringing" coil, (B4) fully out (counter clockwise).
Short the horizontal peaking resistor R88.
Turn the horizontal drive control clockwise until crowding of the center of picture is noticed, then slightly counter clockwise until the crowding just disappears.
If crowding of picture cannot be obtained, leave the control at maximum clockwise.
Remove the horizontal discriminator tube V15 from its socket.
Carefully turn the horizontal frequency slug, (B1) until the picture moves back and forth with blanking bar vertical.
Replace V15 in its socket.
Increase the brightness and decrease the contrast until the normally blanked edges of the raster are visible. Adjust the horizontal phase slug, (B2) until 1/8 inch of blanking is visible at right hand side of picture.
Remove the short from R88 and readjust the horizontal drive control as outlined above.
Turn B4 until approximately 1/8 inch of blanking is visible at right edge of raster.
Slowly turn B1 until picture loses sync as indicated by the presence of several diagonal bars, then turn B1 in reverse direction, noting least number of bars just before picture falls into sync.
This number should be from 3 to 5.
Repeat the same procedure with B1, in the opposite from the original direction, again noting the least number of bars before synchronization.
The number should be from 3 to 5 as before.
Remove V15 from its socket, adjust B1 until the picture moves back and forth across the screen, with blanking bar vertical, then replace V15.
HORIZONTAL SIZE AND LINEARITY ADJUSTMENTS
Turn the horizontal size control fully clockwise and set the horizontal size switch at that position which gives a picture just wide enough to fill the picture mask without objectionable overshoot.
If necessary reduce overshoot by turning horizontal size control slightly counter clockwise.
Adjust the horizontal linearity slug, (B3) for a picture that is symmetrical from left to right. A slight retouch of the horizontal drive control may be necessary for optimum results.

AGC ADJUSTMENT

This adjustment has been correctly set at the factory and should normally require no further adjustment.
If adjustment becomes necessary as indicated by poor horizontal or vertical sync, or poor picture contrast, proceed as follows:
Turn the set on and tune to a channel on which no picture is received.
Turn the contrast control to mid-position.
Turn the AGC control fully clockwise.
Connect a VTVM between pin 5 of V8 and chassis and set the AGC control to obtain a negative reading of .1 volt. On some receivers the closest approach to this reading will be the fully clockwise position.
Tune in the strongest TV station available and set the contrast control at 7/8 maximum.
If the VTVM reading at pin 5 of V8 is between 0 and minus 2 volts the AGC control is properly set.
If the reading is more than 2 volts negative slowly turn the AGC control counter clockwise while observing picture.
The picture will get darker and start to fall out of sync as evidenced by a sudden shift or jittering.
Turn the AGC control clockwise slightly beyond the point where the jittering ceases.



HIGH VOLTAGE COMPARTMENT



HIGH VOLTAGE COMPARTMENT

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6CB6	6CBb	7CH	
V2	Converter	12AT7	12AT7	9A	
V3	1st. Video IF Amp.	6CB6	6CB6	7CH	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CH	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CH	
V6	Video Detector-AGC Clamper	6AL5	6AL5	6BT	
V7	Video Output	6BF5	6BF5	7BZ	
V8	AGC Amplifier-Sync Amplifier-Sync Clipper	6SN7GT	6SN7GT	8BD	
V9	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V10	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V12	Audio Output	6K6GT	6K6GT	7B	
V13	1st. Sync Separator AGC Rectifier-2nd Sync. Separator	12AX7	12AX7	9A	
V14	Vert. Oscillator-Vert. Output	6BL7GT	6BL7GT	8BD	
V15	Horiz. Discr.	6AL5	6AL5	6BT	
V16	Horiz. AFC	6AU6	6AU6	7BK	
V17	Horiz. Oscillator-Horiz. Discharge	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	5642	5642	5642	
V21	HV Rectifier	5642	5642	5642	
V22	LV Rectifier	5U4G	5U4G	5T	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SYLVANIA PART No.	SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V24	20DP4A	20DP4A	12D	① Circuit changes necessary
		20DP4 ①	12D	② 3/8" shorter
		20CP4 ① ②	12D	
		20CP4A ②	12D	
		20HP4 ①	12C	
		20HP4A ①	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	350	161-2003	AFH2-84		UPT44445		TVL-2675	▲ Filter
B	80	350							▲ Filter
C2A	40	350	161-4002	AFH4-109		UPT424		TVL-4707	■ Filter
B	10	450							▲ Horiz. Output Cathode
C	60	350							▲ Audio Output Dec.
D	25	25							Audio Output Cathode
C3A	60	200	161-4003	AFH4-107		UPT411			Bias Filter
B	10	450							▲ Vert. Output Dec.
C	100	50							▲ Vert. Output Cathode
D	10	450							■ Decoupling
C4	2	50	161-1001	PRS150/4		BBR-2-50		TVA-1301	Stabilizing Cap.
C5	10	25	161-1000	PRS25/10		BR105		TVA-1204	AGC Filter
C6	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	RF Coupling
C7A	1000			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	RF Amp. Dec.
B	1000								Mixer Plate Dec.
C8	500			SI500	D6-501	TM5T5	GP2K-501	5GA-T5	RF Amp. Dec.
C9A	1000			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	RF Amp. Cathode
B	1000								RF Amp. Fil. Bypass
C10	500			SI500	D6-501	TM5T5	GP2K-501	5GA-T5	Fixed Padder
C11	25			SI25	D6-250		GP1K-250	5GA-Q25	Fixed Padder
C12	33				TCN-33		N750K-330	5TCU-Q33	Fixed Padder
C13	47			SI47N750	TCN-47		N750K-470	5TCU-Q47	RF Coupling
C14	30				TCN-30		N750K-300		Fixed Trimmer
C15	15				TCN-15		N750K-150	5TCU-Q15	Osc. Grid Cap.
C16	5			SI5N750			N750K-050		Osc. Feedback
C17A	1000			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	Osc. Plate Bypass
B	1000								Conv. Fil. Bypass
C18	15				TCN-15		N750K-150	5TCU-Q15	Fixed Trimmer †
C19	3						N750K-030		Fixed Trimmer *
C20	100		166-0100P	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C21	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C22	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Dec.
C23	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	5HK-D1	1st. Video IF Fil.
C24	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C25	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C26	330	G500	163-0330	1468-00035	SI330		D6-331	1FM-335	2nd. Video IF Dec.
C27	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	5HK-D1	2nd. Video IF Fil.
C28			166-0001P	1468-000001	TCZ-1		NP0K-010		IF Coupling
C29	4.7		168-0008N	SI4. 7NP0	TCZ-4. 7		NP0K-4R7		Fixed Trimmer
C30A	4000		168-0003D	BPD-2X004	D6-402	TM5DD4	822-004	5HK-2DD4	3rd. Video IF Dec.
B	4000				D6-402				3rd. Video IF Cathode
C31	1000		160-4000D	BPD-001	DD-102	TM5D1	801-001	5HK-D1	3rd. Video IF Fil.
C32	10		160-0010P	SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Video Det. Filter
C33	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Bias Filter
C34	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Video Output Screen
C35	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Bias Filter
C36	47			SI47 NP0	TCZ-47		NP0K-470	5TCC-Q47	Fixed Trimmer *
C37	.2	300	162-0202	P488-22		PTE4P22		2TM-P22	Video Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C38	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Bias Filter
C39	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C40	4.7		168-0008N	SI4. 7NP0	TCZ-4. 7		NP0K-4R7		Sound IF Coupling
C41	10		166-0010P	SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Voltage Divider
C42A	4000		168-0003D	BPD-2X004	D6-402	TM5DD4	822-004	5HK-2DD4	1st. Sound IF Dec.
B	4000				D6-402				1st. Sound IF Cathode
C43	47		166-0047N	SI47	D6-470	5W5Q5	GP1K-470	5GA-Q47	Sound IF Coupling
C44	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Sound IF Dec.
C45	250		166-0250P	SI250	D6-251	TM5T25	GP2K-251	5GA-T25	Diode Load Cap.
C46	680	500	163-0680	1479-0007	D6-681	1W5T7	GP2K-681	1FM-37	De-emphasis
C47	10000		168-0002N	SI10000	D6-103	TM5S1	GP2-333-103	5HK-S1	Audio Coupling
C48	10000		190-0006	SI10000	D6-103	TM5S1	GP2-333-103	5HK-S1	Tone Comp. ¶
C49	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C50	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C51	10000		168-0002N	SI10000	D6-103	TM5S1	GP2-333-103	5HK-S1	Audio Coupling
C52	100	500	163-0100	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	AF Amp. Plate Bypass
C53	.01	600	162-0611	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C54	.005	600	162-0625	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C55	.003	600	162-0623	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	AGC Rect. Cathode
C56	.005	600	162-0625	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Sync Coupling
C57	.047	200	160-04147	P288-047	D7-503	PTE4S47		2TM-S47	Sync Coupling
C58	.01	600	162-0611	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync Coupling
C59A	.002			P688-002		PTE6D2	GP2-333-202		Vert. Integrator Net.
B	.005		♦ 190-0007	P688-005	♦PC-100	PTE6D5	GP2-333-502	♦101C1	Vert. Integrator Net.
C	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C60	750	500	163-0750	1464-00075					Vert. Osc. Grid Cap.
C61	.003	600	162-0623	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Bias Filter
C62	.1	400	162-0601	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Discharge
C63	.003	600	162-0623	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Vert. Sweep Coupling
C64	.01	600	162-0611	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Integrator Net.
C65	.1	400	162-0601	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C66	100	500	163-0100	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Horiz. Sync Coupling
C67	.005	600	162-0625	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Fixed Trimmer
C68	.005	600	162-0625	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Horiz. AFC Filter
C69	.1	200	162-0601	P288-1	DF-104	PJ2P1		2TM-P1	Horiz. AFC Filter
C70	100	500	163-0100	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Horiz. Phase Shifter
C71	.015	400	163-0010	P488-015		PTE6S15		6TM-S15	Fixed Trimmer
C72	.1	200	162-0601	P288-1	DF-104	PJ2P1		2TM-P1	RF Bypass
C73	.002	400	162-04225	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Horiz. Osc. Grid Cap.
C74	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. Osc. Dec.
C75	.01	400	162-0611	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz. Sweep Coupling
C76	5000		166-5000D	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. Discharge Dec.
C77	680	500	163-0680	1479-0007		2R5T7		MS-37	Horiz. Discharge
C78	1000		166-1000P	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	Horiz. Sweep Coupling
C79	.047	400	160-04147	P488-047	DF-503	PTE4S47		4TM-S47	Horiz. Output Screen
C80	.1	600	162-0601	P688-1		PTE6P1		6TM-P1	Damper Filter
C81	.033	600	162-0613	P688-033					Damper Filter
C82	.22	200	160-02022	P488-22		PTE4P22		2TM-P22	Horiz. Sweep Coupling
C83	750	1500	174-0750A						Fixed Trimmer
C84	.1	600	160-0601	P688-1	DF-104	PTE6P1		6TM-P1	RF Bypass
C85	.1	600	160-0601	P688-1	DF-104	PTE6P1		6TM-P1	RF Bypass
C86	750	1500	174-0750A						Fixed Trimmer
C87	1200	1500	174-1200A						Fixed Trimmer
C88	500	10000	160-14350	HV10C	TV3-501	MM-C10T5		50IC1	HV Doubler
C89	.0005	10000	160-14350	10084-0005		PTE10T5		TVM-351	HV Filter
C90	2								Ant. Isolation

* Not used in all models
† Some models use 10MMF in this application
¶ Items C48 and R50 are combined in one unit
♦ Items C59A, C59B, C59C, R69A, R69B, R69C are combined in one unit

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2Meg		157-0009	QJ-205*	RTV-280	SBBT-694-S	Brightness Control -Panel
B	1Meg						Volume Control & Sw. -Rear-Tap@ 200KΩ
R2A	250KΩ		153-0007	Q11-130	AG-55-S	AB-50	Horiz. Drive Control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	1Meg		153-0009	Q11-137	AG-61-S	AB-69	AGC Control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R3 A per instructions
R4A	5000Ω		153-0010	Q11-114	AG-19-S	AB-12	Vert. Linearity Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	1.5Meg		153-0014	Q11-138	AG-83-S	AN-75	Vert. Hold Control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	1Meg		153-0001	Q11-137	AG-61-S	AB-69	Height Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	250Ω	2	153-3007	WK-250	A43-390	VK-123	Contrast Control-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R7A per instructions
R8A	20KΩ	4	153-3009		A10-20K	SVP-982	Horiz. Size Control-Wire wound
B	Shaft		Not Req.		FS-3	Not Req.	Attach to R8A per instructions.

*CONCENTRIKIT EQUIVALENT -KIT K-2, BASE ELEMENTS & SHAFTS B11-139 & P1-220 (Panel) B13-137X &R2-306 (Rear) & SWITCH 76-1

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	SYLVANIA PART No.	IRC PART No.	IDENTIFICATION CODES
R9	1000Ω 20%			BTS-1000	RF Amp. Grid
R10	68Ω				RF Amp. Cathode
R11	1000Ω 20%			BTS-1000	RF Amp. Decoupling
R12	1800Ω				Parasitic Suppressor
R13	100KΩ 20%			BTS-100K	Mixer Grid
R14	4700Ω			BTS-4700	Isolation - See Note 1
R15	18KΩ 20%				Osc. Grid
R16	470Ω			BTS-470	Osc. Plate
R17	470Ω			BTS-470	Decoupling
R18	6.8Meg		161-0685	BTS-6.8Meg	AGC Network
R19	100KΩ		161-0104	BTS-100K	AGC Network
R20	8200Ω		161-0822		1st. Video IF Amp. Grid
R21	56Ω		161-0560		1st. Video IF Amp. Cathode
R22	2200Ω 20%	1	162-0222	BTA-2200	1st. Video IF Amp. Decoupling
R23	1000Ω 20%		161-0102	BTS-1000	AGC Network

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	SYLVANIA PART No.	IRC PART No.	IDENTIFICATION CODES
R24	47KΩ		161-0473		2nd. Video IF Coil Shunt
R25	56Ω		161-0560		2nd. Video IF Amp. Cathode
R26	2200Ω 20%	1	162-0222	BTA-2200	2nd. Video IF Amp. Decoupling
R27	27KΩ		161-0273		3rd. Video IF Coil Shunt
R28	180Ω		161-0181	BTS-180	3rd. Video IF Amp. Cathode
R29	1000Ω 20%		161-0102	BTS-1000	3rd. Video IF Amp. Decoupling
R30	5600Ω		161-0562		4th Video IF Coil Shunt
R31	39000Ω 5%		161-03925	BTS-3900 5%	Video Det. Diode Load
R32	6800Ω		161-0682	BTS-6800	AGC Network
R33	100Ω 20%		161-0101	BTS-100	Bias Network
R34	15KΩ 20%		161-0153	BTS-15K	Video Peaking Coil Shunt
R35	8200Ω	2	163-0822	BTB-8200	Video Output Plate
R36	7500Ω 5%	2	163-07525	BTB-7500 5%	Video Output Plate
R37	180KΩ 5%		161-01845	BTS-180K 5%	Video Peaking
R38	1.2Meg 5%		161-01255	BTS-1.2Meg 5%	Picture Tube Cathode
R39	470KΩ 20%		161-0474	BTS-470K	Picture Tube Grid
R40	15KΩ 20%		161-0153	BTS-15K	Voltage Divider
R41	150KΩ 20%		161-0154	BTS-150K	Voltage Divider
R42	47KΩ 20%		161-0473		1st Sound IF Amp. Grid
R43	100Ω 20%		161-0101	BTS-100	1st Sound IF Amp. Cathode
R44	47KΩ		161-0473		Coil Shunt
R45	1000Ω 20%		161-0102	BTS-1000	1st. Sound IF Amp. Decoupling
R46	47KΩ 20%		161-0473		2nd Sound IF Amp. Grid
R47	22KΩ 20%		161-0223		2nd Sound IF Amp. Decoupling
R48	100KΩ 20%		161-0104	BTS-100K	De-emphasis
R49	68KΩ		161-0683	BTS-68K	Ratio Det. Diode Load
R50	47KΩ		¶190-0006	BTS-47K	Tone Compensation
R51	15Meg 20%		161-0156	BTS-15Meg	AF Amp. Grid
R52	220KΩ 20%		161-0224	BTS-220K	AF Amp. Plate
R53	470Ω 20%		161-0471	BTS-470	Decoupling
R54	470KΩ 20%		161-0474	BTS-470K	Output Grid
R55	270Ω		182-0271	BTA-270	Output Cathode
R56	470Ω	2	183-0471	BTB-470	Output Decoupling
R57	10KΩ		161-0103	BTS-10K	AGC Network
R58	330KΩ 5%		161-03345	BTS-330K 5%	AGC Network
R59	560KΩ 5%		161-05645	BTS-560K 5%	AGC Network
R60	2.2Meg		161-0225	BTS-2.2Meg	AGC Network
R61	10KΩ 20%		161-0103	BTS-10K	Isolation
R62	33KΩ		161-0333	BTS-33K	Sync Separator Plate
R63	10KΩ 20%		161-0103	BTS-10K	Isolation
R64	1Meg 20%		161-0105	BTS-1Meg	Sync Separator Grid
R65	12KΩ		161-0123	BTS-12K	Sync Separator Plate
R66	1.2Meg		161-0125	BTS-1.2Meg	Sync Amp. Grid
R67	33KΩ	1	182-0333	BTA-33K	Sync Amp. Plate
R68	15KΩ	2	183-0153	BTB-15K	Sync Amp. Plate
R69A	22KΩ		♦190-0007	BTS-22K	Integrator Network
B	8200Ω			BTS-8200	Integrator Network
C	3200Ω			BTS-8200	Integrator Network
R70	1.2Meg		161-0125	BTS-1.2Meg	Vert. Osc. Grid
R71	47KΩ 20%		161-0473	BTS-47K	Vert. Osc. Transformer Shunt
R72	470KΩ		161-0474	BTS-470K	Vert. Osc. Plate
R73	100KΩ 20%		161-0104	BTS-100K	Decoupling
R74	47000Ω 5%		161-04725	BTS-4700 5%	Vert. Peaking
R75	680KΩ 20%		161-0684	BTS-680K	Vert. Output Grid
R76	680Ω 20%		161-0681	BTS-680	Vert. Output Cathode
R77	100KΩ		161-0104	BTS-100K	Horiz. Discr. Diode Load
R78	100KΩ		161-0104	BTS-100K	Horiz. Discr. Diode Load
R79	1Meg 20%		161-0105	BTS-1Meg	Horiz. Discr. Diode Load
R80	470KΩ 20%		161-0474	BTS-470K	Horiz. AFC Filter
R81	8200Ω		161-0822	BTS-8200	Horiz. AFC Filter
R82	4.3Ω		189-0007		Filament Dropping - Wire Wound
R83	1000Ω 20%		161-0102	BTS-1000	Horiz. AFC Grid
R84	470KΩ 20%		161-0474	BTS-470K	Horiz. Osc. Grid
R85	22KΩ		161-0223	BTS-22K	Horiz. Osc. Coil Shunt
R86	150KΩ 20%		161-0154	BTS-150K	Horiz. Discharge Grid
R87	82KΩ		161-0823	BTS-82K	Horiz. Discharge Plate
R88	4700Ω		161-0472	BTS-4700	Horiz. Peaking
R89	100Ω 20%		161-0101		Parasitic Suppressor
R90	470KΩ 20%		161-0474	BTS-470K	Horiz. Output Grid
R91	150Ω	3	189-0020		Horiz. Output Cathode - Wire Wound
R92	100Ω 20%		161-0101		Parasitic Suppressor
R93	6800Ω	3	187-0004		Horiz. Output Screen - Wire Wound
R94	4700Ω	2	183-0472	BTB-4700	Decoupling
R95	1000Ω 20%	2	183-0102	BTB-1000	Horiz. Linearity Coil Shunt
R96	6800Ω	1	161-0682	BTS-6800	Current Limiting
R97	1.5Meg	2	189-0019		HV Rectifier Load
R98	1.5Meg	2	189-0019		HV Rectifier Load
R99	10KΩ	1	161-0103		HV Filter
R100A	3000Ω	7	188-0001		Voltage Divider - Wire Wound
B	1185Ω	7			Voltage Divider - Wire Wound
R101	270Ω	5	187-0003	1 3/4A-250	Voltage Divider - Wire Wound
R102	22KΩ	2		BTB-22K 5%	Voltage Divider - See Note 2
R103	3600Ω	3	189-0023		Voltage Divider - Wire Wound
R104	180Ω 5%	1	161-01815	BTS-180 5%	Voltage Divider
R105	220KΩ 20%		161-0224	BTS-220K	Line Isolation
R106	47Ω		161-0470		Parasitic Suppressor

Note 1. Some Models use a 2200Ω Resistor in this application
Note 2. Some Models use a 3300Ω Resistor in this application
¶ Items R50, C48 are combined in one unit
♦ Items R69A, R69B, R69C, C59A, C59B, C59C are combined in one unit

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @2.2A	520VCT @.320A	5VAC @6A	6.3VAC 4.2A SEC. #4 6.3VAC @8A	141-0013	P-8167 ③		

③ Drill new Mtg. Holes

SYLVANIA MODELS
22B-11, 22M-11, 23B-11, 23M-11 (Ch. 1-507-1)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	145Ω	625Ω	242-0001	A-8111	A-3000	TB0-1 ①	Vert. Osc. Trans.
T3	82Ω Tap ⓐ30Ω	10Ω SEC.#2 10Ω SEC #3 0Ω SEC.#4 0Ω	241-0006				Horiz. Output Trans.
T4	920Ω Tap ⓐ 8.5Ω		241-0004	A-8123	A-3037	TS0-5 ②	Vert. Output Trans.
T5A	20Ω		100-0007				Horiz. Deflection Coils
B	50Ω						Vert. Deflection Coils

① Mount on top of Chassis
②. Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	5.3KΩ	3.7Ω	520Ω	.7Ω	143-0021	A-3877	A-2930	R0-8	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	P.M.	3.7Ω	539-0600	Mod. P6-X ST-108	6A1	
	CONE DIA.	V. C. DIA.				
SP1B	6"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.300A	41Ω	1.2Hy.	145-0004	C-2326	C-2996 ①	TR-3300	① Drill one new Mtg. hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SYLVANIA PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L2	Ant. Trans.	0Ω	0Ω			
L3	RF, Mixer Grid & Osc.	0Ω				Low Band
L4	RF Coil	0Ω				High Band
L5	Mixer Grid	0Ω				High Band
L6	Osc. Coil	0Ω				High Band
L7	Cath. Choke	.2Ω				
L8	Fil. Choke	.2Ω				
L9	RF Choke	0Ω				
L10	1st. Video IF	.1Ω				
L11	IF Coupling	0Ω				
L12	Fil. Choke	0Ω		147-0014		
L13	2nd. Video IF	.2Ω	.2Ω	125-0002		
L14	Fil. Choke	0Ω		147-0014		
L15	3rd. Video IF	.2Ω	.2Ω	125-0002		
L16	Adj. Channel Sound Trap	.2Ω		118-0007		
L17	4th. Video IF	.4Ω	1Ω	120-0002		
L18A	Peaking Coil	7.2Ω		131-2004	TV-184	
B	Peaking Coil	9Ω			TV-185	Part of L18A
L19A	Peaking Coil	5Ω		131-2003	TV-184	
B	Peaking Coil	7.2Ω			TV-185	Part of L19A
L20A	1st. Sound IF	5.6Ω		130-0001	TV-151	
L21	2nd. Sound IF	3.6Ω		146-0012		
L22	Ratio Det.	12.2Ω	1.5ΩCT	128-0008	TV-115	Tertiary Winding .7Ω
L23	Horiz. Osc.	39Ω	80Ω	128-0006		Secondary Tapped ⓐ 40Ω, Feedback Winding 9.5Ω
L24	Ringing Coil	35Ω		146-0005		
L25	Horiz. Lin.	7.5Ω		133-0001		Tap ⓐ 4.5Ω
L26	4.5MC Trap	5.8Ω				

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA SYLVANIA PART No. FUSE	SYLVANIA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1/4A. 250V.	191-0005	487-0008	312-250	357001	AGC-1/4	4405

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M2	RF Tuner	323-0014	Complete with tubes
M3	Switch	513-0005	Horiz. Size
M4	Focus Magnet	400-0008	
M5	Ion Trap	400-0011	
	Knob	740-0028	Off/On Volume - Tuning
	Knob	744-0016	Brightness
	Knob	743-0018	Channel Indicator

PHOTOFACT* Folder

WESTINGHOUSE
MODEL H-688K24 (Ch. V-2219-1)

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MODEL H-688K24

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DATE 7-52 SET 174 FOLDER 14

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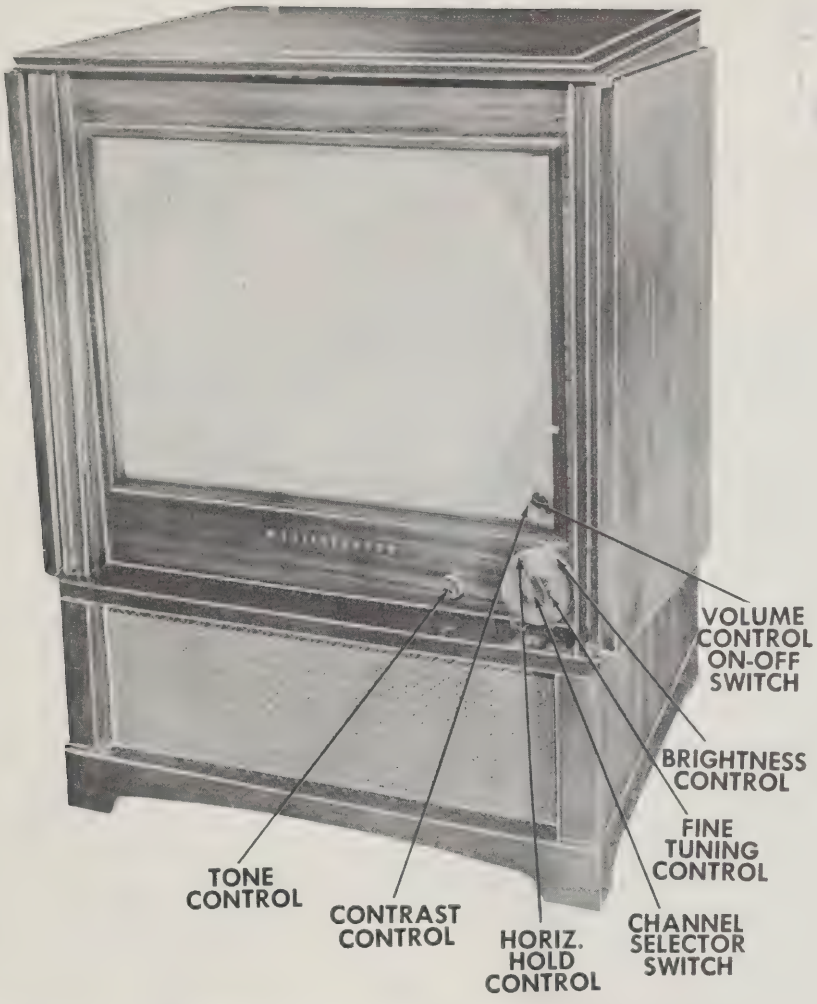
MODEL H-688K24 (Ch. V-2219-1)



WESTINGHOUSE
MODEL H-688K24 (Ch. V-2219-1)

TRADE NAME	Westinghouse Model H-688K24 (Ch. V-2219-1)
MANUFACTURER	Westinghouse Electric Corp., Television - Radio Div., Sunbury, Pa.
TYPE SET	Television Receiver
TUBES	Twenty Four
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 2.42 Amp. @ 117 volts AC
TUNING RANGE	Channels 2 thru 13

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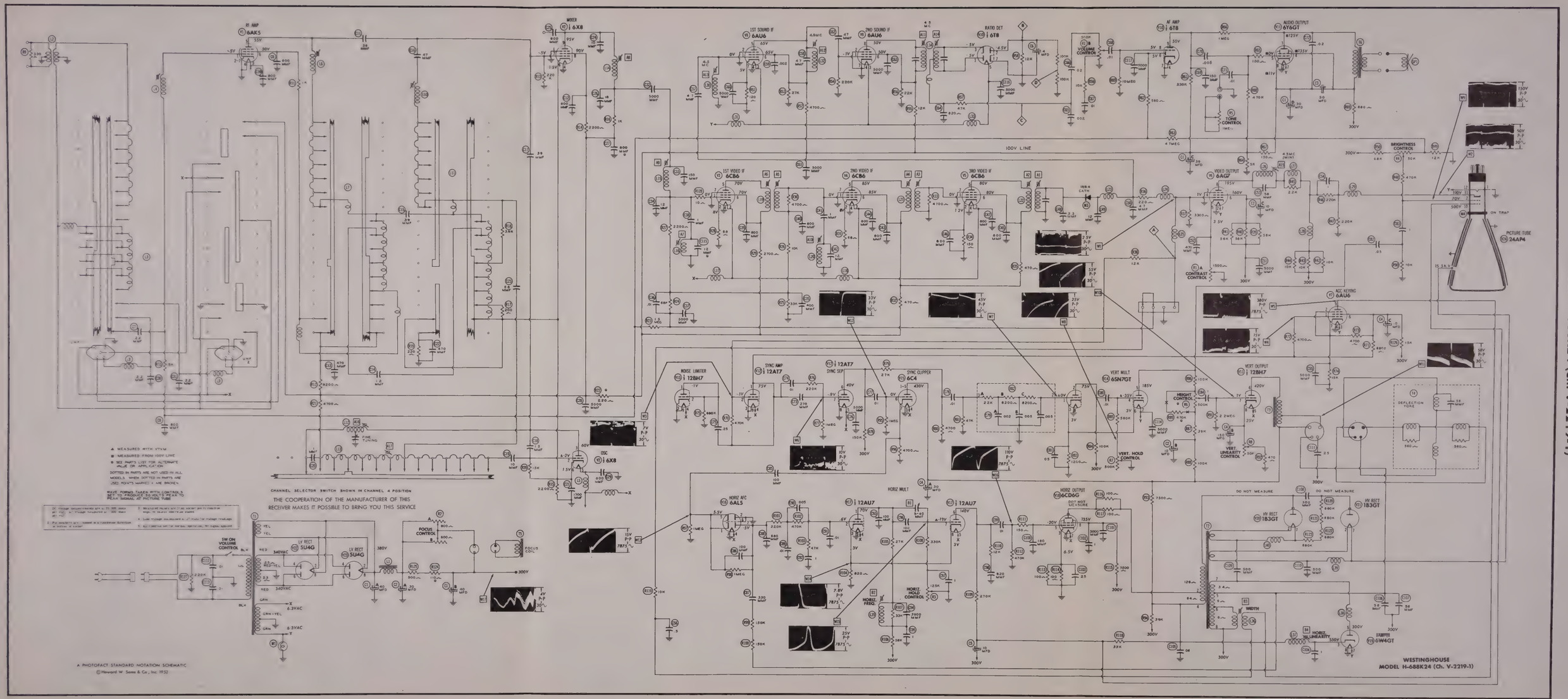

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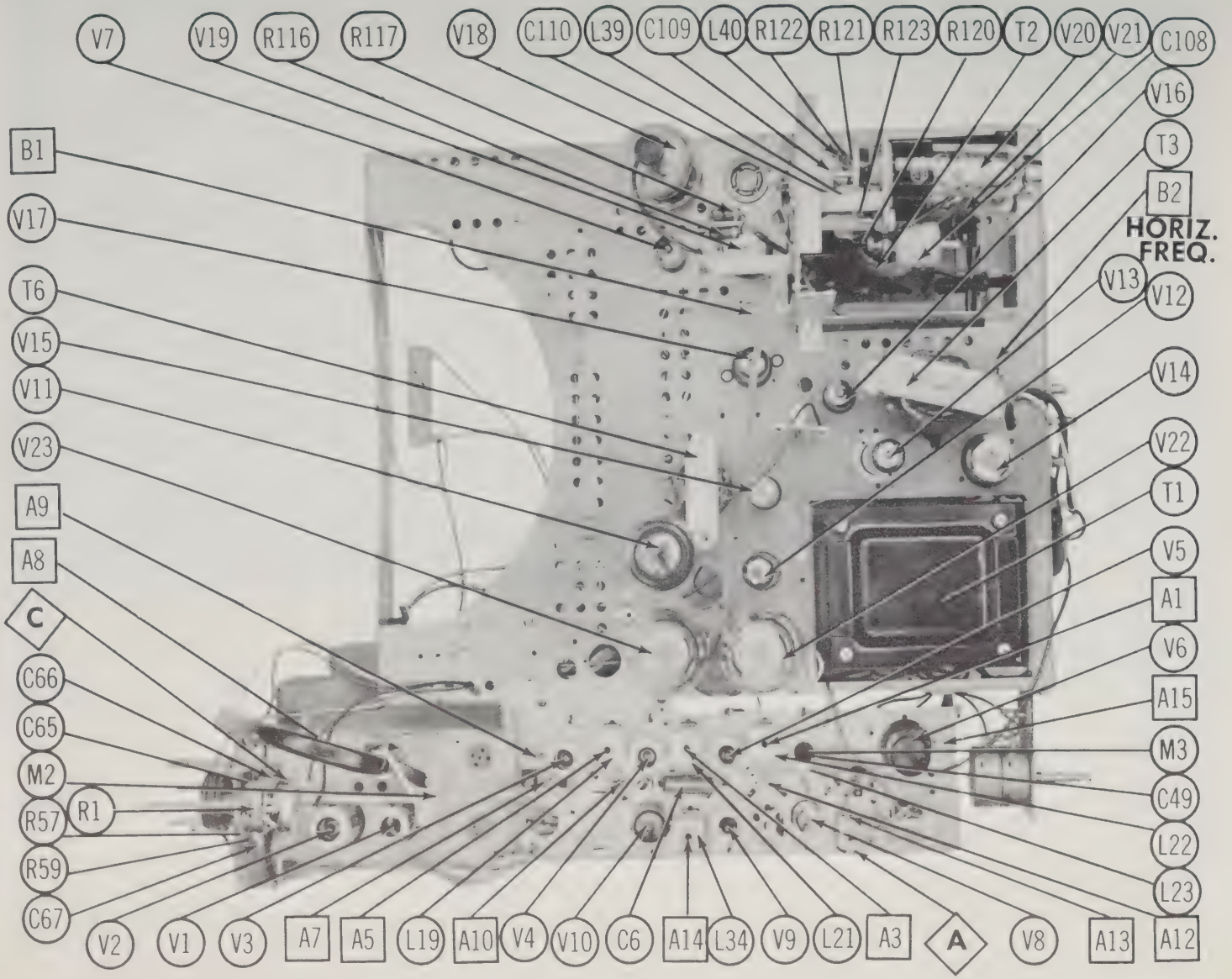
MODEL H-688K24 (Ch. V-2219-1)



CHASSIS TOP VIEW

MODEL H-688K24 (Ch. V-2219-1)
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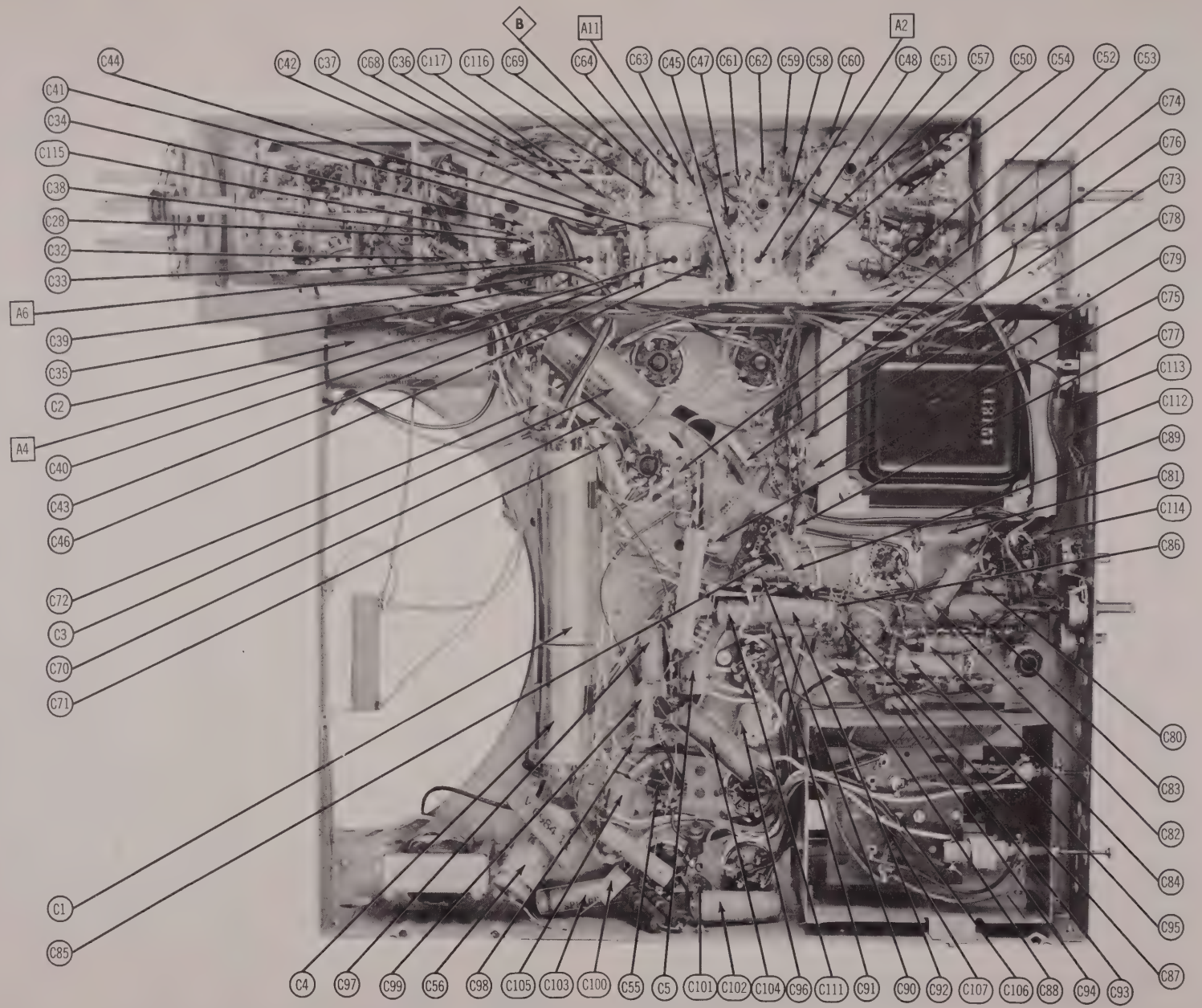
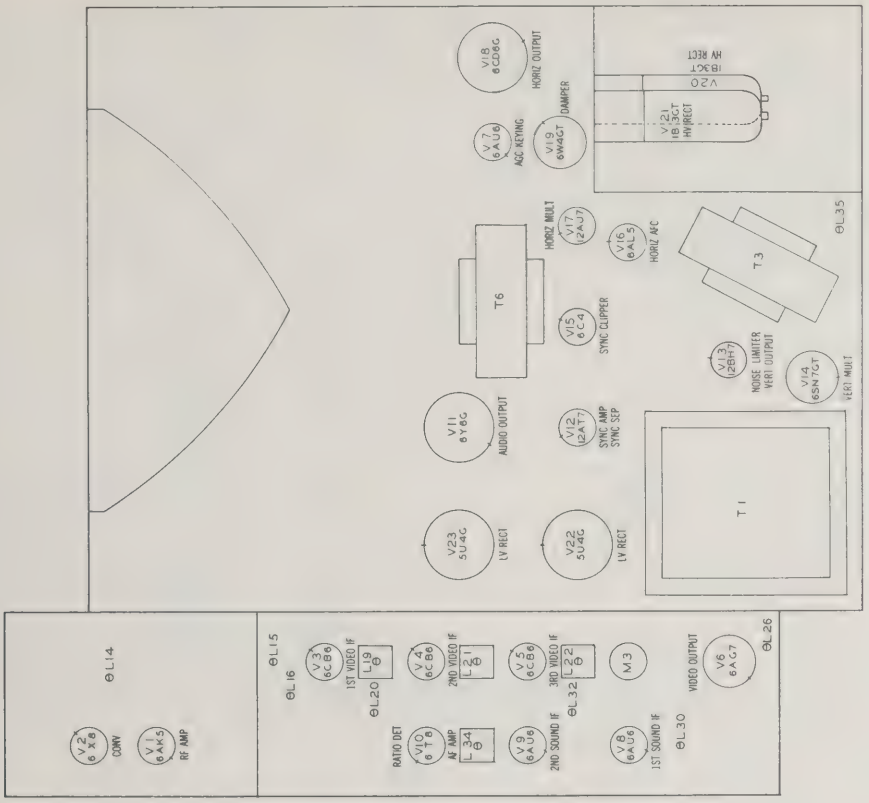
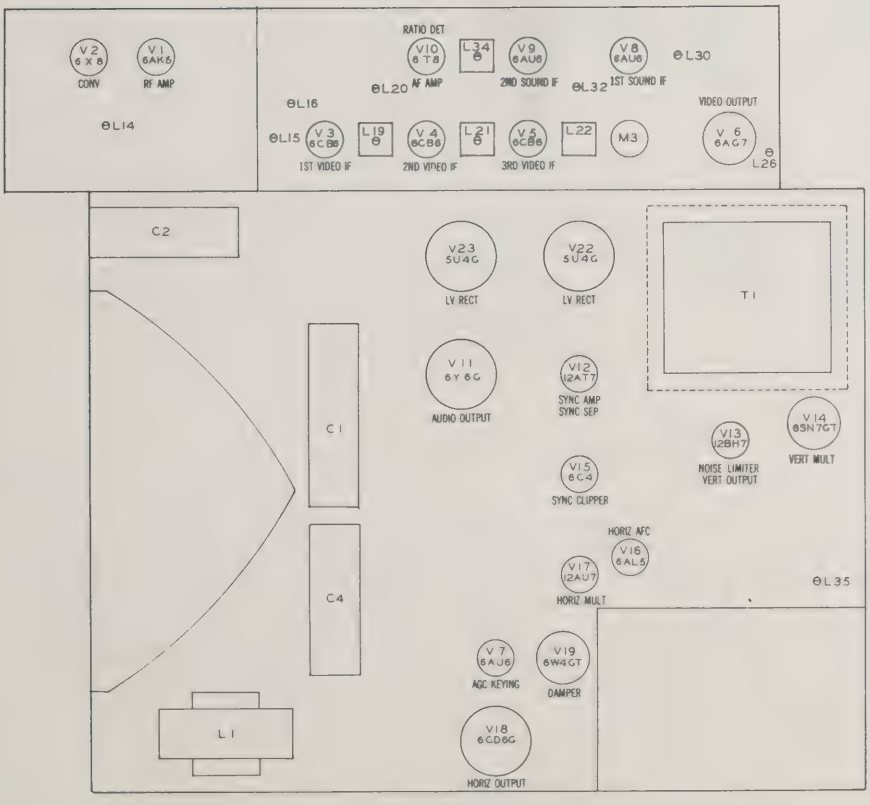
3924 MEADE ST
DENVER, COLORADO



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

During steps 1 and 2 it is necessary to detune the primary winding of the transformer to which the sweep generator is connected. This can be accomplished by clipping an alligator clip to pin 5 of the preceding stage. The capacity thus added will sufficiently detune the transformer. CAUTION ! B+

The scope should be connected through a decoupling network consisting of a 47KΩ resistor in series with the high lead to the scopes vertical amplifier and 470MMF across the input terminals to the vertical amplifier.

Connect the negative lead of a 9 volt battery to AGC test terminal and the positive lead to chassis.

Remove V1 from its socket to reduce undesirable beat response .

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 6CB6(V5). Low side to chassis.	44MC (10MC Swp)	42.25MC 44. MC 45.75MC	13	Vert. amp. thru 47KΩ to point ⟨A⟩. Low side to chassis.	A1, A2	Adjust for response curve similar to fig. 1
2.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	"	"	"	"	A3, A4	Adjust for response curve similar to fig. 2
3.	"	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	"	"	"	"	A5, A6	Adjust A10 fully counter clockwise, then adjust A5 and A6 for response curve similar to fig. 3.
4.	Direct	High side to an ungrounded tube shield floating over converter tube V2. Low side to chassis.	"	41.25MC 42.25MC 44. MC 45.75MC	"	"	A7, A8 A9	Adjust A7 until the slug is centered in the coil. Adjust A8 and A9 for a curve of maximum height and symmetrical about 44MC. Adjust A7 for MINIMUM response at 41.25 MC. Final curve should be similar to fig. 4 If necessary retouch A8 and A9 for desired response. It may be possible to obtain two individual peaks with A8. Select the one giving desired response.
5.	.01MFD	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	Not used	47.25MC (400∿ Mod.)	"	"	A10	Adjust for MINIMUM 400∿ response. Recheck A5 and A6 for fig. 4 response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point B to B-. The junction of these two resistors is alignment point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD	High side to point ⟨A⟩. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point ⟨B⟩. Common to chassis.	A11, A12 A13	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point ⟨C⟩. Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD	High side to point ⟨A⟩. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point ⟨B⟩. Low side to chassis.	A11, A12 A13	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as per fig. 5.
7.	"	"	"	"	"	Vert. amp. to point ⟨C⟩ Low side to chassis.	A14	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 6. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point ⟨A⟩. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector (fig. 7) to pin 11 of picture tube. Common to chassis.	A15	Adjust for MINIMUM deflection.

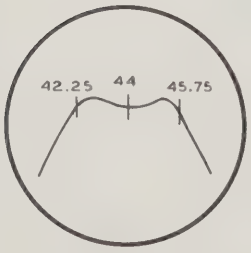


FIG.1

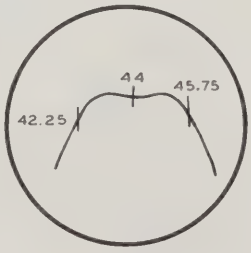


FIG.2

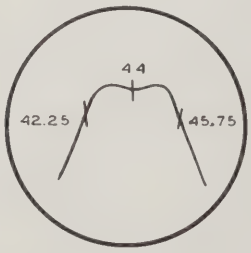


FIG.3

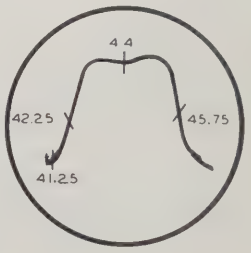


FIG.4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Connect the negative lead of a 9 volt battery to the AGC test point and the positive lead to chassis.
Replace V1 in its socket.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across external antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC	13	Vert. amp. thru decoupling network to point (A). Low side to chassis.	A16	Adjust to place video marker at 50% response as per fig. 8.
10.	"	"	207MC (10MC Swp)	205.25MC	12	"		Check all high band channels for proper placement of video marker. If necessary make small compromise adjustment of A16 for correct marker placement.
			201MC (10MC Swp)	199.25MC	11			
			195MC (10MC Swp)	193.25MC	10			
			189MC (10MC Swp)	187.25MC	9			
			183MC (10MC Swp)	181.25MC	8			
			177MC (10MC Swp)	175.25MC	7			
11.	"	"	85MC (10MC Swp)	83.25MC	6	" "	A17	Adjust to place video marker at 50% response as per fig. 8.
12.	"	"	79MC (10MC Swp)	77.25MC	5	"		Check all low band channels for proper placement of video marker. If necessary make small compromise adjustment of A17 for correct marker placement.
			69MC (10MC Swp)	67.25MC	4			
			63MC (10MC Swp)	61.25MC	3			
			57MC (10MC Swp)	55.25MC	2			

THE RF AND MIXER PORTIONS OF THIS RECEIVER HAVE BEEN PROPERLY ALIGNED AT THE FACTORY ARE VERY STABLE. ALIGNMENT OF THESE PORTIONS SHOULD NOT BE ATTEMPTED IN THE FIELD.

FIG. 5

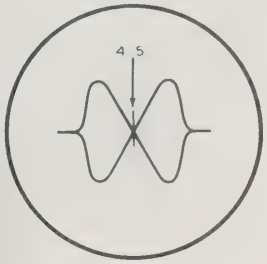


FIG. 6

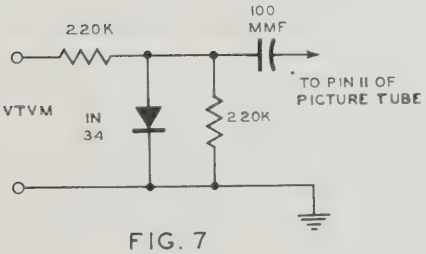


FIG. 7

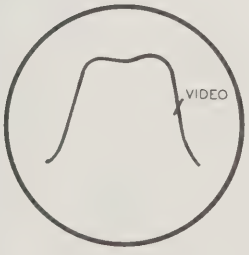
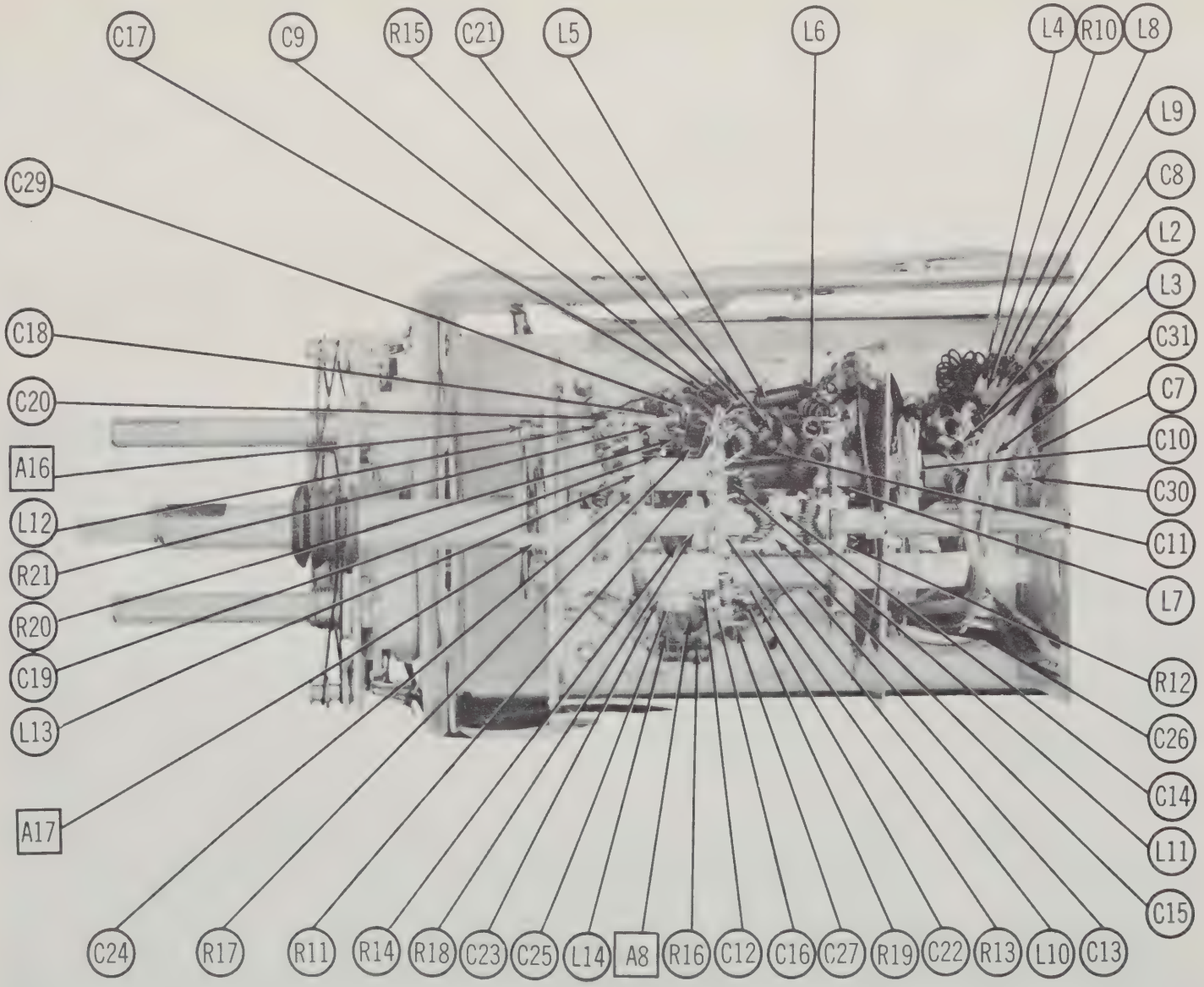


FIG. 8

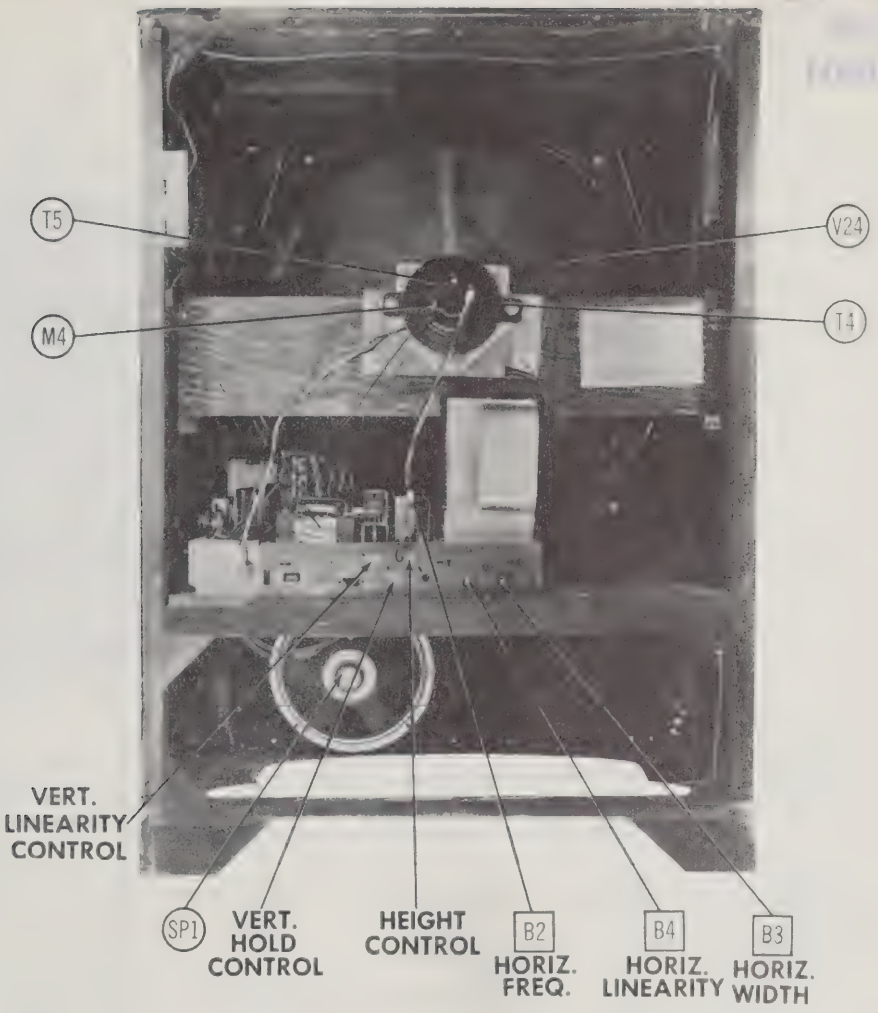
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AK5	1.1Meg	0Ω	.1Ω	0Ω	■8.3KΩ	■9.3KΩ	0Ω		
V 2	6X8	0Ω	15KΩ	■4.8KΩ	0Ω	.1Ω	220Ω	220KΩ	■2.3KΩ	■1.1KΩ
V 3	6CB6	35KΩ	68Ω	.1Ω	0Ω	■2.7KΩ	■2.7KΩ	0Ω		
V 4	6CB6	43KΩ	68Ω	.1Ω	0Ω	■470Ω	■470Ω	0Ω		
V 5	6CB6	.5Ω	150Ω	.1Ω	0Ω	■940Ω	■940Ω	0Ω		
V 6	6AG7	0Ω	0Ω	0Ω	3.3KΩ	110Ω	†19KΩ	.1Ω	†3.7KΩ	
V 7	6AU6	†20KΩ	12KΩ	.1Ω	0Ω	110KΩ	†11KΩ	12KΩ		
V 8	6AU6	5.8Ω	0Ω	.1Ω	0Ω	■4.2KΩ	■4.2KΩ	120Ω		
V 9	6AU6	220KΩ	0Ω	.1Ω	0Ω	■8KΩ	■8KΩ	0Ω		
V 10	6T8	INF	12KΩ	INF	0Ω	.1Ω	1.1Meg	0Ω	10Meg	■250KΩ
V 11	6Y6G	INF	0Ω	†1.1KΩ	†980	■470KΩ	■470KΩ	.1Ω	■150Ω	
V 12	12AT7	†16KΩ	15KΩ	0Ω	.1Ω	.1Ω	28KΩ	1Meg	0Ω	0Ω
V 13	12BH7	680KΩ	680KΩ	0Ω	.1Ω	.1Ω	#8.1KΩ	2.2Meg	2.9KΩ	0Ω
V 14	6SN7GT	85KΩ	†100KΩ	1.2KΩ	820KΩ	#490KΩ	1.2KΩ	.1Ω	0Ω	
V 15	6C4	#7.5KΩ	INF	0Ω	.1Ω	#7.5KΩ	1Meg	4.7KΩ		
V 16	6AL5	1Meg	0Ω	0Ω	.1Ω	1Meg	0Ω	2Meg		
V 17	12AU7	†83KΩ	2.7Meg	820Ω	.1Ω	.1Ω	#300KΩ	380KΩ	820Ω	0Ω
V 18	6CD6G	INF	0Ω	50Ω	INF	470KΩ	INF	.1Ω	†7.8KΩ	TOP CAP #134Ω
V 19	6W4GT	INF	†310Ω	50KΩ	INF	†310Ω	INF	.1Ω	0Ω	
V 20	1B3GT	PINS	1 - 8	HAVE	INF	RESISTANCE				TOP CAP #210Ω
V 21	1B3GT	PINS	1 - 8	HAVE	INF	RESISTANCE				TOP CAP #INF
V 22	5U4G	INF	20KΩ	INF	25Ω	INF	23Ω	INF	20KΩ	
V 23	5U4G	INF	20KΩ	INF	25Ω	INF	23Ω	INF	20KΩ	
V 24	24AP4	0Ω	500KΩ	PIN 10 #33KΩ	PIN 11 110KΩ	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PINS 8 OF V22 & V23.
# MEASURED FROM PIN 3 OF V19
■ MEASURED FROM 100 VDC LINE


C17
C9
R15
C21
L5
L6
L4
R10
L8
L9
C29
C8
L2
L3
C18
C31
C20
C7
A16
C10
L12
C30
R21
C11
R20
L7
C19
R12
L13
C26
C14
A17
L11
C15
C24
R17
R11
R14
R18
C23
C25
L14
A8
R16
C12
C16
C27
R19
C22
R13
L10
C13

RF TUNER

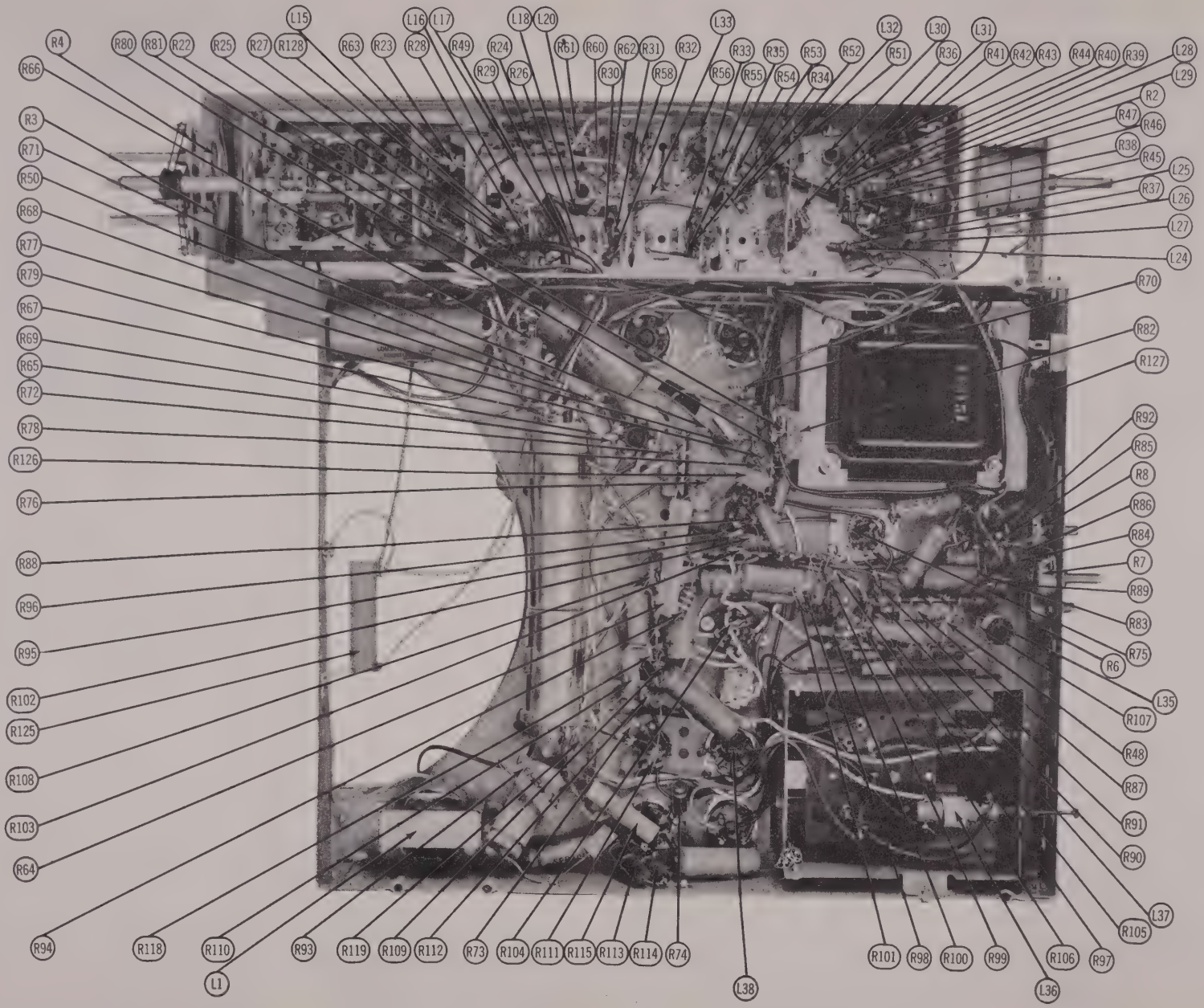


CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

1. Remove 8 push on type control knobs from front panel.
2. Remove 8 wood screws. Remove rear cover.
3. Remove 2 wood screws and 2 clamps. Remove antenna lead from cabinet.
4. Disconnect antenna ground, speaker, yoke plug, fucus plug, cry socket and HV lead.
5. Disconnect tone control.
6. Remove 4 screws holding speaker. Remove speaker.
7. Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		Westinghouse PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6AK5	6AK5	7BD	
V2	Converter	6X8	6X8	9AK	
V3	1st. Video IF Amp.	6CB6	6CB6	7CH	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CH	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CH	
V6	Video Output	6AG7	6AG7	8Y	
V7	AGC Keying	6AU6	6AU6	7BK	
V8	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V9	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V11	Audio Output	6Y6GT	6Y6GT	7AC	
V12	Sync Amplifier - Sync Separator	12AT7	12AT7	9A	
V13	Noise Limiter-Vert. Output	12BH7	12BH7	9A	
V14	Vert. Multibrator	6SN7GT	6SN7GT	8BD	
V15	Sync Clipper	6C4	6C4	6BG	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	12AU7	12AU7	9A	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	
L23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	Westinghouse PART No.	SYLVANIA PART No.			
V24	24AP4			12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450	V-11244-1	AFH3-44		UPT4445-		TVL-3787	▲ Filter
B	40	450		PRS450/30		3335		TVA-1711	■ Filter
C	30	450							▲ Decoupling
D	30	450							Audio Output Cathode
C2A	30	450	V-10786-1	PRS450/30		BR3045A		TVA-1711	Filter (Red)
B	10	450		PRS450/10		BRD1145A		TVA-2722	Decoupling (Blue)
C	10	450		PRS450/10					Video Amp. Screen (Green)
C3	30	450	V-6570	PRS450/30		BR3045A		TVA-1711	Audio Output Decoupling
C4A	30	450	V-10603-1	AFH4-87		UPT4145-		TVL-3753	▲ Vert. Output Dec.
B	150	50				V10			▲ Vert. Output Cathode
C	10	450							■ Keyed AGC Screen
C5	10	450	V-10293-1	PRS500/10		BR1045A		TVA-1705	Horiz. MV Decoupling
C6	4	50	V-4637	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C7	22			SI22	D6-220		GP1K-220	5GA-Q22	RF Coupling
C8	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	AGC Filter
C9	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Amp. Screen Bypass
C10	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Amp. Fil. Bypass
C11	.36						NP0K-R36		RF Coupling
C12	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	Mixer Screen Bypass
C13	470			SI470	D6-471		GP2K-471	5GA-T47	RF Bypass
C14	1.2						NP0K-1R2		RF Coupling
C15	.39						NP0K-R39		RF Coupling
C16	47			SI47	D6-470		GP1K-470	5GA-Q47	RF Coupling
C17	.39						NP0K-R39		Osc. Coupling
C18	1.5						N330K-1R5		Osc. Feedback
C19	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Osc. Grid Cap.
C20	1				TCZ-1		NP0K-010		Fixed Trimmer
C21	1000			BPD-001	DD-102	TM5D1	801-001	5HK-D1	Conv. Cathode
C22	470			SI470	D6-471		GP2K-471	5GA-T47	Conv. Cathode
C23	.68				TCZ-.68		NP0K-R68		Osc. Coupling
C24	10			SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C25	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	IF Coupling
C26	18								Fixed Trimmer
C27	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Bypass
C28	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C29	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	Conv. Fil. Bypass
C30	22				TCZ-22		NP0K-220	5TCC-Q22	Voltage Divider
C31	22				TCZ-22		NP0K-220	5TCC-Q22	Voltage Divider
C32	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	IF Coupling
C33	150	500		1468-00015	D6-151	5W5T15	GP2K-151	1FM-312	Voltage Divider
C34	12		R3CC20SL120K	SI12	D6-120		GP1K-120	MS-415	Fixed Trimmer
C35	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	AGC Filter
C36	.01	400	RCP10W4103M	P488-01	D6-103	PTE481	GP2-333-103	4TM-S1	AGC Filter
C37	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C38	1		V-5658-1	1468-000001	TCZ-1		NP0K-010		IF Coupling
C39	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	1st. Video IF Dec.
C40	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	AGC Filter
C41	1		V-5658-1	1468-000001	TCZ-1		NP0K-010		IF Coupling
C42	12		R3CC20SL120K	SI12	D6-120		GP1K-120	MS-415	Fixed Trimmer
C43	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	2nd. Video IF Dec.
C44	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	2nd. Video IF Fil.
C45	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	3rd. Video IF Dec.
C46	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	3rd. Video IF Cathode
C47	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	3rd. Video IF Fil.
C48	3.3		V-9926-2	SI3.3NP0	TCZ-3.3		NP0K-3R3		Fixed Trimmer
C49	12		R3CC20SL120K	SI12	D6-120		GP1K-120	MS-415	Video Det. Filter
C50	4.7		V-9926-3	SI47 NP0	TCZ-4.7		NP0K-4R7		Video Det. Filter
C51	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C52	470	500	RCM20B471K	1469-0005	D6-471	5R5T5	GP2K-471	MS-35	Video Output Cathode
C53	56	500	RCM20B560K					MS-46	Fixed Trimmer
C54	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C55	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Keyed AGC Cathode

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C56	.5	400	RCP10W4504M	485-5		PJ4P5		4TM-P5	AGC Filter
C57	4.7		V-9926-3	814-7NP0	TCZ-4.7		NP0K-4R7		Sound IF Coupling
C58	47	500	RCM47H47M	1469-00005	D6-470	5R5Q5	GP1K-470	MS-45	Fixed Trimmer
C59	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	1st. Sound IF Dec.
C60	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st.Sound IF Cathode
C61	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C62	47	500	RCM20B470K	1468-00005	D6-470	5W5Q5	GP1K-470	1FM-45	Sound IF Coupling
C63	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd.Sound IF Dec.
C64	820	500	RCM20C821K						Diode Load Cap.
C65	.002	400	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	De-emphasis
C66	.02	400	RCP10W4203M	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C67	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C68	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C69	150	500	RCM20B151M	1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	AF Amp. Plate Bypass
C70	.005	400	RCP10W4502M	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C71	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C72	.02	600	RCP10W6203M	P688-02	DF-203	PTE6S2		6TM-S2	Audio Output Plate
C73	270	500	RCM20B271K	1469-0003	D6-271	5R5T3	GP2K-271	MS-33	Sync Coupling
C74	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Sync Coupling
C75	.25	400	RCP10W4254M	P488-25		PTE4P25		4TM-P25	Sync Coupling
C76	5000		V-5596	TM5D5	DD-502	TM5D5	811-005	5HK-D5	Sync Amp. Fil.
C77	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Sync Coupling
C78	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. Sync Coupling
C79A	.002			P688-002		PTE6D2	GP2-333-202		Vert. Integrator Net.
B	.005		• V-9213	P688-005	•PC-100	PTE6D5	GP2-333-502	•101C1	Vert. Integrator Net.
C	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C80	.01	400	RCP10W4103K	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. MV Feedback
C81	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		4TM-S5	Vert. MV Cathode
C82	.05	400	RCP10W4503K	P488-05	DF-503	PTE4S5		4TM-S5	Vert. Discharge
C83	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C84	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C85	100	500	RCM20B101K	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Horiz. Sync. Coupling
C86	100	500	RCM20B101K	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Horiz. AFC Filter
C87	330	500	RCM20B331K	1469-00035	D6-331		GP2K-331		Horiz. Feedback
C88	680	500	RCM20B681K	1479-0007	D6-681	2R5T7	GP2K-681	MS-37	Horiz. Discharge
C89	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Voltage Divider
C90	.005	400	RCP10W4502M	P688-005	D6-502	PTE6D5	GP2-333-502	6TM -D5	Horiz. AFC Filter
C91	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz. AFC Filter
C92	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Horiz. AFC Filter
C93	100	500	RCM20B101K	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Horiz. MV Plate Bypass
C94	3900	500	RCM30C392K	1464-004		1DR5D4			Fixed Trimmer
C95	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Horiz. MV Decoupling
C96	100	500	RCM20B101K	1469-0001		5R5T1		MS-31	Horiz. MV Feedback
C97	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Horiz. Hold Bypass
C98	820	500	RCM20C821K						Horiz. Discharge
C99	.01	600	RCP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Horiz. Sweep Coupling
C100	180	500	RCM20C181J	1469-0002		5R5T2		MS-32	Horiz. Output Grid
C101	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. Output Screen
C102	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Output Screen
C103	.25	400	RCP10W4254M	P488-25		PTE4P25		4TM-P25	Horiz. Output Cathode
C104	.1	600	RCP10M6104M	P688-1		PTE6P1		6TM-P1	Damper Filter
C105	.06	600	RCP10M6603M	684-06		PTE6S6		6TM-S6	Damper Filter
C106	56		V-9792-10560K						Fixed Trimmer
C107	56		V-9792-10560K						Fixed Trimmer
C108	500	20000	V-9901-2	HV20C	TV3-502	MM-C20T5			HV Doubler
C109	500	20000	V-9901-2	HV20C	TV3-502	MM-C20T5			HV Filter
C110	500	20000	V-9901-2	HV20C	TV3-502	MM-C20T5			HV Filter
C111	.25	400	RCP10W4254M	P488-25		PTE4P25		4TM-P25	Horiz. Sweep Coupling
C112	.01	600	V-5040-15	689ZGXY-01		PJ6S1		6TM-P1	Line Filter
C113	.01	600	V-5040-15	689ZGXY-01		PJ6S1		6TM-P1	Line Filter
C114	5000		V-5596	BPD-005 •	DD-502	TM5D5	811-005	5HK-D5	Vert. MV Fil. Bypass
C115	12			SH2	D6-120		GP1K-120	5GA-Q12	Fixed Trimmer ¶
C116	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Ratio Det. Fil.
C117	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Clamper Filter

† Some models use 470MMF in this application
• Items C79A, C79B, C79C, R82A, R82B, R82C are combined in one unit.
¶ Some models use variable trimmer 1.6-18MMF in this application (Part #V-9876)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1500Ω	½	V-10854-2	QJ-324*	RTV-317		Contrast Control - Panel
B	500KΩ	½					Vol. Control & SW.-Rear-Tapped @ 50KΩ
R2A	800Ω	3	V-11214-1		RTV-326		Focus Control - Wire wound
B	800Ω	3					Focus Control - Wire Wound
R3A	125KΩ	½	V-10915-1	QH-228	AG-52-S	AB-40	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Attach to R3A per instructions
R4A	50KΩ	½	V-10914-1	QH-123	AG-44-S	AB-31	Brightness Control
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Attach to R4A per instructions
R5A	1½eg	½	V-10130-4	QH-137	AG-63-Z	B-70	Tone Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R5A
R6A	500KΩ	½	V-9813-3	QH-133	AG-58-S	AB-59	Height Control - See Note
B	Shaft		Not Req.	SQ	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	500KΩ	½	V-9894-1	QH-133	AG-58-S	B-59	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Attach to R7A per instructions
R8A	50KΩ	½	V-6463	QH-114	AG-19-S	AB-10	Vert. Linearity Control
B	Shaft		Not Req.	SQ	FKS-1/4	AK-1	Attach to R8A per instructions

NOTE : SOME MODELS USE ALTERNATE CONTROL (PART #V-9813-4)
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-110 & P1-200 (Panel)
B18-133X & R2-216 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING	WATTS	REPLACEMENT DATA Westinghouse PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ±10% UNLESS OTHERWISE NOTED
R9	330Ω	20%	½	RC20AE331K	BTS-330	Antenna Loading
R10	15KΩ	20%	½		BTS-15K	RF Amp. Grid
R11	1000Ω		½		BTS-1000	RF Amp. Screen
R12	8200Ω		½			RF Amp. Decoupling
R13	220KΩ		½			Mixer Grid
R14	2200Ω	20%	½		BTS-2200	Mixer Screen
R15	2200Ω	20%	½		BTS-2200	Mixer Cathode
R16	1000Ω		½		BTS-1000	Mixer Plate
R17	200Ω	5%	½			Mixer Cathode

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING	WATTS	REPLACEMENT DATA Westinghouse PART No.	IRC PART No.	IDENTIFICATION CODES
R18	3900Ω		½		BTS-3900	Mixer Cathode Coil Shunt
R19	220Ω		½		BTS-220	Mixer Cathode
R20	15KΩ	20%	½		BTS-15K	Oscillator Grid
R21	4700Ω	20%	2		BTS-4700	Oscillator Plate
R22	220Ω		1		BTA-220	Decoupling - See Note 1
R23	1.5Meg		½	RC20AE155K	BTS-1.5Meg	AGC Network
R24	68KΩ		½	RC20AE683K	BTS-68K	AGC Network
R25	33KΩ		½	RC20AE333K	BTS-33K	AGC Network
R26	10KΩ	20%	½	RC20AE103M	BTS-10K	AGC Network
R27	2200Ω		½	V-9927-9	BTS-2200	1st.Video IF Grid
R28	68Ω		½	RC20AE680K		1st.Video IF Cathode
R29	2700Ω	20%	½	RC20AE272K	BTS-2700	1st.Video IF Decoupling
R30	4700Ω	5%	½	V-9927-2	BTS-4700 5%	2nd.Video IF Coil Shunt
R31	68Ω		½	RC20AE680K		2nd.Video IF Cathode
R32	470Ω	20%	½	RC20AE471M	BTS-470	Decoupling
R33	4700Ω	5%	½	V-9927-2	BTS-4700 5%	3rd.Video IF Coil Shunt
R34	150Ω		½	RC20AE151K	BTS-150	3rd.Video IF Cathode
R35	470Ω	20%	½	RC20AE471M	BTS-470	3rd.Video IF Decoupling
R36	220Ω		½	RC20AE221M	BTS-220	Video Det. Diode Load
R37	3300Ω		½	RC20AE332K	BTS-3300	Video Det. Diode Load
R38	12KΩ		½	RC20AE123K	BTS-12K	Isolation
R39	56KΩ		1	RC30AE563K	BTA-56K	Video Output Screen
R40	56KΩ		1	RC30AE563K	BTA-56K	Video Output Screen
R41	56KΩ		1	RC30AE563K	BTA-56K	Video Output Screen
R42	10KΩ		2	RC40AE103K	BTB-10K	Video Output Plate
R43	10KΩ		2	RC40AE103K	BTB-10K	Video Output Plate
R44	10KΩ		2	RC40AE103K	BTB-10K	Video Output Plate
R45	22KΩ		½	RC20AE223K	BTS-22K	Peaking Coil Shunt
R46	220KΩ		½	RC20AE224K	BTS-220K	Video Peaking
R47	220KΩ		½	RC20AE224K	BTS-220K	Pict. Tube Cathode
R48	470KΩ		½	RC20AE474K	BTS-470K	Pic. Tube Grid
R49	12KΩ		½	RC20AE123K	BTS-12K	Voltage Divider
R50	68KΩ		1	RC30AE683K	BTA-68K	Voltage Divider
R51	120Ω		½	RC20AE121K	BTS-120	1st.Sound IF Cathode
R52	4700Ω		1	RC30AE472K	BTA-4700	1st.Sound IF Decoupling
R53	27KΩ		½	RC20AE273K	BTS-27K	Voltage Divider
R54	220KΩ		½	RC20AE224K	BTS-220K	2nd.Sound IF Grid
R55	12KΩ		½	RC20AE123K	BTS-12K	2nd.Sound IF Decoupling
R56	22KΩ		½	RC20AE223K	BTS-22K	Voltage Divider
R57	47KΩ		½	RC20AE473K	BTS-47K	De-emphasis
R58	12KΩ		½	RC20AE123K	BTS-12K	Ratio Det. Diode Load
R59	10KΩ	20%	½	RC20AE103M	BTS-10K	Tone Compensation
R60	10Meg	20%	½	RC20AE106M	BTS-10Meg	AF Amp. Grid
R61	330KΩ		½	RC20AE334K	BTS-330K	AF Amp. Plate
R62	560Ω		½	RC20AE561K	BTS-560	AGC Network
R63	4.7Meg		½	RC20AE475K	BTS-4.7Meg	AGC Network
R64	5KΩ		10	V-9800-7	1 3/4A-5K	Voltage Divider
R65	150Ω	20%	½	RC20AE151M		Parasitic Suppressor
R66	1Meg		½	RC20AE105K	BTS-1Meg	Tone Compensation
R67	150Ω		1	RC30AE151K	BTA-150	Decoupling
R68	470KΩ		½	RC20AE474K	BTS-470K	AF Output Grid
R69	680Ω		5	V-6984-2	1 3/4A-700	AF Output Dec.
R70	470KΩ		½	RC20AE474K	BTS-470K	Sync Amp. Grid
R71	6800Ω	5%	½	RC20AE682M	BTS-6800 5%	Sync Amp. Plate
R72	4700Ω		½	RC20AE472K	BTS-4700	Isolation
R73	4700Ω		1	RC30AE472K	BTA-4700	Bleeder
R74	15KΩ		2	RC40AE153K	BTB-15K	AGC Cathode
R75	680KΩ		½	RC20AE684K	BTS-680K	Noise Clipper Diode Load
R76	220KΩ		½	RC20AE224K	BTS-220K	Isolation
R77	1Meg		½	RC20AE105K	BTS-1Meg	Sync Sep. Grid
R78	150KΩ		½	RC20AE154K	BTS-150K	Sync Sep. Plate
R79	27KΩ		½	RC20AE273K	BTS-27K	Voltage Divider
R80	4700Ω		½	RC20AE472K	BTS-4700	Voltage Divider
R81	47KΩ		½	RC20AE473K	BTS-47K	Differentiator
R82A	22KΩ		½		BTS-22K	Integrator Network
B	8200Ω		½	V-9213	BTS-8200	Integrator Network
C	8200Ω		½		BTS-8200	Integrator Network
R83	1200Ω		½	RC20AE122K	BTS-1200	Vert. M. V. Cathode
R84	100KΩ		1	RC30AE104K	BTA-100K	Vert. M. V. Plate
R85	560KΩ		½	RC20AE564K	BTS-560K	Vert. M.V. Grid
R86	100KΩ		9	RC20AE104K	BTB-100K	Vert. M.V. Plate
R87	39KΩ		½	RC20AE393K	BTS-39K	Vert. M.V. Plate
R88	100KΩ		½	RC20AE104K	BTS-100K	Vert. M.V. Plate Dec.
R89	470KΩ		½	RC20AE474K	BTS-470K	Height Control Shunt - See Note 2
R90	10KΩ		½	RC20AE103K	BTS-10K	Vert. Peaking
R91	2.2Meg		½	RC20AE225K	BTS-2.2Meg	Vert. Output Grid
R92	470Ω		½	RC20AE471K	BTS-470	Vert. Output Cathode
R93	7500Ω		5	V-6984-11	1 3/4A-7500	Vert. Output Dec.
R94	39KΩ		2	RC40AE393K	BTB-39K	Voltage Divider
R95	1Meg		½	RC20AE105K	BTS-1Meg	Sync Clipper Grid
R96	4700Ω		½	RC20AE472K	BTS-4700	Sync Clipper Cathode
R97	1Meg		½	RC20AE105K	BTS-1Meg	Horiz. AFC Diode Load
R98	1Meg		½	RC30AE105K	BTS-1Meg	Horiz. AFC Diode Load
R99	150KΩ		1	RC30AE154K	BTA-150K	Horiz. AFC Feedback
R100	150KΩ		1	RC30AE154K	BTA-150K	Horiz. AFC Feedback
R101	220KΩ		½	RC20AE224K	BTS-220K	Horiz. AFC Filter
R102	470KΩ		½	RC20AE474K	BTS-470K	Horiz. AFC Filter
R103	47KΩ		½	RC20AE473K	BTS-47K	Horiz. AFC Filter
R104	820Ω		½	RC20AE821K	BTS-820	Horiz. M.V. Cathode
R105	27KΩ		½	RC20AE273K	BTS-27K	Horiz. M.V. Plate
R106	56KΩ		1	RC30AE563K	BTA-56K	Horiz. M.V. Plate Dec.
R107	33KΩ		½	RC20AE333K	BTS-33K	Ringing Coil Shunt
R108	330KΩ	5%	½	RC20AE334J	BTS-330K 5%	Horiz. M.V. Grid
R109	270KΩ	5%	½	RC20AE274J	BTS-270K 5%	Horiz. M.V. Plate
R110	12KΩ		½	RC20AE123K	BTS-12K	Horiz. Peaking
R111	150Ω	20%	½	RC20AE151M		Parasitic Suppressor
R112	470KΩ		½	RC20AE474K	BTS-470K	Horiz. Output Grid
R113	100Ω		2	RC40AE101K		Horiz. Output Cathode
R114	100Ω		2	RC40AE101K		Horiz. Output Cathode
R115	7500Ω		10	V-9800-3	1 3/4A-7500	Horiz. Output Screen
R116	100Ω		2	RC40AE101K		Parasitic Suppressor
R117	100Ω		2	RC40AE101K		Parasitic Suppressor
R118	33KΩ		½	RC20AE333K	BTS-33K	Decoupling
R119	10KΩ		½	RC20AE103K	BTS-10K	AGC Network
R120	680KΩ	20%	1	RC30AE684M		H.V. Rect. Load
R121	680KΩ	20%	1	RC30AE684M		H.V. Rect. Load
R122	680KΩ	20%	1	RC30AE684M		H.V. Rect. Load
R123	680KΩ	20%	1	RC30AE684M		H.V. Rect. Load
R124	110Ω		5	V-6984-7		Focus Coil Shunt - See Note 3

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Westinghouse PART No.	IRC PART No.	IDENTIFICATION CODES
R125	500Ω	25	V-11229-1	4½E-500	Focus Coil Shunt
R126	15KΩ	5	V-6984-15	1 3/4A-15K	Voltage Divider
R127	220KΩ	20% 1	RC30AE224M	BTA-220K	Line Isolation
R128	10Ω	½	RC20AE100K		Parasitic Suppressor

Note 1. Some Models may use a 150Ω Resistor in this application
Note 2. Not used with alternate height control
Note 3. Not used in all Models

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	680VCT @	5VAC	12.6VCT	V-9958-5		P-3066 ②	
	① 2.42A.	.295ADC	@ 6A	@ 5.8A				

② Parallel two 5V winding.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING SEC.	REPLACEMENT DATA Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	190Ω Tap @ 64Ω	13Ω Tap @ .6Ω, 9.5Ω	V-10833-1				Horiz. Output Trans.
		SEC. 2 0Ω					
		SEC. 3 0Ω					
T3	1600Ω Tap @ 7Ω		V-10909-1	A-8141	A-3039		Vert. Output Trans.
T4A	13Ω		V-10560-3	DY-8	MDF-70		Horiz. Deflection Coils
B	49Ω						Vert. Deflection Coils
T5	485Ω		V-9253-4	FC-11			Focus Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	2KΩ	3.4Ω	140Ω	.5Ω	V-9685	A-3876 ①	A-3018	RO-2 ①	① Drill new mtg. holes

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA Westinghouse PART No.	JENSEN PART No.	QUAM • PART No.	NOTES
SP1A	PM	3.4Ω	V-9770-1		10A4A	
	CONE DIA.	V. C. DIA.				
SP1B	10"	1"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~v)	REPLACEMENT DATA Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.220 A	40Ω	1.5 Hy.	V-6471-2	C-2326 ①	C-2991 ①	TR-3300 ①	① Drill one new mtg. hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Westinghouse PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	Ant. Trans.	.1Ω	.1Ω				
L3	Ant. Coils	0Ω					
L4	Ant. Coil	0Ω					
L5	Fil. Choke	0Ω					
L6	RF Coil	0Ω					
L7	RF Coils	0Ω					
L8	U.H.F. Ant. Coil	0Ω					
L9	U.H.F. Ant. Coil	0Ω					
L10	Mixer Grid Coil	0Ω					
L11	Mixer Grid Coils	0Ω					
L12	Osc. Coil	0Ω					
L13	Osc. Coils	0Ω					
L14	Conv. Plate	.1Ω					
L15	1st. Video IF	.1Ω		V-9882-4			
L16	41.25MC Trap	0Ω		V-10586-1			
L17	Fil. Choke	0Ω		V-4886-2			
L18	Fil. Choke	0Ω		V-4886-2			
L19	2nd. Video IF	.5Ω	.5Ω	V-9879			
L20	Adj. Channel IF Trap	0Ω		V-10771-1			
L21	3rd. Video IF	.5Ω	.5Ω	V-9879			
L22	4th. Video IF	.5Ω	.5Ω	V-9880			
L23	RF Choke	1Ω		V-4886-1			
L24	Peaking Coil	4.2Ω		V-9915-1	TV-183		100 Microhenries
L25	RF Choke	1Ω		V-4886-1			
L26	4.5MC Trap	.9Ω		V-9882-3	TV-151		
L27	Peaking Coil	5.8Ω		V-5902-1	TV-184		140 Microhenries
L28	Peaking Coil	7.8Ω		V-5902-5	TV-185		250 Microhenries
L29	RF Choke	1Ω		V-4886-1			
L30	1st. Sound IF	5.8Ω		V-9882-3	TV-151		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Westinghouse PART No.	MERIT PART No.	IRC PART No.	
L31	Fil. Choke	0Ω		V-4886-2			
L32	2nd. Sound IF	1.1Ω		V-9882-2	TV-151		
L33	Fil. Choke	0Ω		V-4886-2			
L34	Ratio Det.	4.1Ω	1.2ΩCT	V-9884	*TV-110		Tertiary Winding . 6Ω
L35	Horiz. Osc.	75Ω		V-6764	TV-163		
L36	Width Coil	1Ω	95Ω	V-9902			
L37	Horiz. Lin.	20Ω		V-9960	MWC-1		
L38	Plate Choke	0Ω		V-4886-2			
L39	Fil. Choke	2.2Ω		V-9099-5		CLA	2.7 Microhenries
L40	Fil. Choke	2.2Ω		V-9099-5		CLA	2.7 Microhenries

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Westinghouse PART No.		
M1	Bayonet	7.5	.2	White			Type #51

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M2	RF Tuner	V-10880-2	
M3	Crystal	V-10916-1	IN64 (Video Det.)
M4	Ion Trap	V-9784-3	
B1	Trimmer	V-11228-1	Horiz. Mult. (5-40MMF)
	Knob	V-9938-1	Off/On - Volume
	Knob	V-9938-2	Tone (Front)
	Knob	V-9939-3	Tone (Rear)
	Knob	V-9939-1	Contrast
	Knob	V-9940-1	Fine Tuning
	Knob	V-10676-2	Channel Selector
	Knob	V-10926-1	Horiz. Hold & Brightness

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Short out the horizontal oscillator coil, L35.

Set the horizontal hold control to the middle of its range.

Connect the DC probe of a VTVM to the junction of R103 and C92 in the pin #2 (grid) circuit of V17. Connect the common lead to chassis.

Turn the set on, tune to a TV station and adjust trimmer (B1) for zero voltage on the VTVM. If zero voltage can be approached but not quite reached it may be necessary to set the horizontal hold control slightly to one side of mid-position to obtain zero voltage.

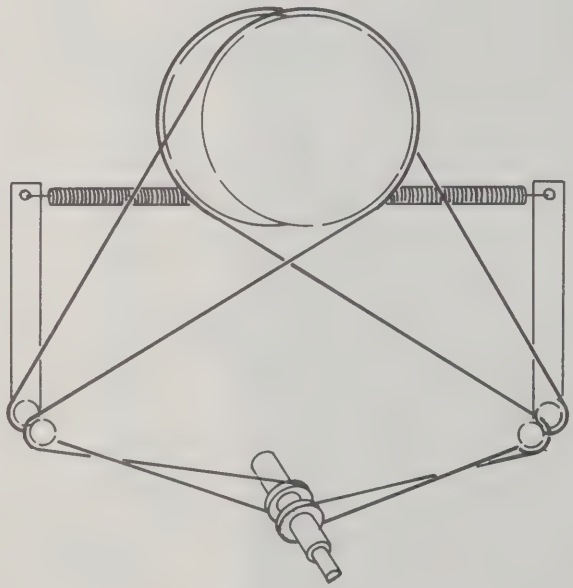
Remove the short from the ringing coil and adjust the horizontal frequency slug (B2) for zero voltage on the VTVM.

Check the adjustment by momentarily tuning to another channel and back. The picture should pull into synchronization.

Adjust the width slug (B3) for a picture slightly larger than enough to fill the picture mask.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TUNING GANG FULLY CLOSED



DRIVE CORD STRINGING

PROPERTY OF
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DENVER, COLORADO